

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

الترم الاول



1 [A] Choose the correct answer :

(1) Which of the following expresses the particles of gases ?

- (a) The interparticle spaces between them are small.
- (b) They are incompressible.
- (c) The attraction forces between them are very weak.
- (d) They move in limited motion.

(2) Walls in hot climate countries are painted in

- (a) light colours to reflect infrared rays.
- (b) dark colours to reflect infrared rays
- (c) light colours to absorb infrared rays.
- (d) dark colours to absorb infrared rays.

[B] Explain the relation between each of the following :

- (1) Type of cells **and** the number of mitochondria organelles in them.
- (2) Gas pressure **and** saving energy in pressure cooker.
- (3) Insulin hormone **and** diabetes disease.
- (4) Photosynthesis **and** type of plastids.

2 [A] Mark (✓) or (X) for each statements, with correction:

- (1) Olivine mineral is formed from magma solidification. ()
- (2) The mineral salts absorbed by plant roots affect the rate of photosynthesis. ()

[B] What happens when :

- (1) Movement of convection currents in the upper mantle.
- (2) Placing polystyrene panels between building walls.
- (3) Adding sodium chloride solution to silver nitrate solution.
- (4) Adding Sudan (IV) solution to fats in a mixture.

3 [A] Complete the following statements:

- (1) Copper sulphate solution colour is, while zinc sulphate solution is
- (2) Gaseous substances are able to diffuse and, while liquid substances are able to flow and

[B] (1) Balance the opposite equation : $C + O_2 \longrightarrow CO$

- (2) You have two equal masses of sand and water at the same temperature. **Which of them** will have a greater increase in temperature when heated by the same heat source for two minutes? **With explanation.**
- (3) **What** is the composition of soda lime mixture? **And what is its importance?**
- (4) **What is the difference between** evaporation process **and** boiling process (In terms of: Temperature).

4 [A] Write the scientific term of each of the following:

- (1) The change of substance directly from solid state to gaseous state without passing through the liquid state.
- (2) Breaking the bonds between the atoms of the reactant molecules and forming new bonds between the atoms of the product molecules.

[B] (1) Rewrite the following equation after balancing it and writing the physical states of the reactants and products:



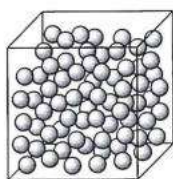
- (2) **What is meant** by fluids?
- (3) **What did** the scientist Helmont conclude from his experiment that lasted 5 years?
- (4) **What is the type of** Mariout soil? **And how** was it formed?

Model 2

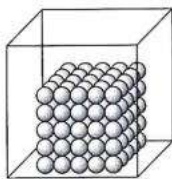
1 [A] Correct the underlined words:

- (1) The affecting factors increase the speed of the chemical reaction without being consumed or changed.
- (2) Fructose is a polysaccharide.

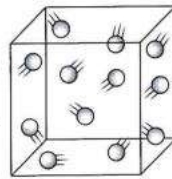
[B] (1) The following figures represent the three main states of matter:



(1)



(2)



(3)

1- What state does each of the three figures represent?

2- What is the type of the movement of the particles of the substance (2) ?

- (2) **Explain** the properties of table sugar before and after burning it.
- (3) **How can it be deduced that** ammonia gas is released from the mouth of a test tube?

2 [A] Choose the correct answer :

(1) Among the reversible processes are

- | | |
|---------------------------|--------------------------------|
| (a) melting and boiling. | (b) boiling and evaporation. |
| (c) melting and freezing. | (d) freezing and condensation. |

(2) Non-renewable resources can be obtained from the following spheres, **except**

- (a) the atmosphere. (b) the lithosphere.
(c) the hydrosphere. (d) the biosphere.

[B] (1) The radiator represents a basic system in all vehicles (types of cars) :

1- **What** is the importance of the radiator in vehicles?

2- **What** is the liquid used in the radiator? **and why?**

(2) **What** is the granum composed of? **and what type of** reactions occur in it?

(3) **Write the symbolic equation** which represents the cellular respiration process.

3 [A] Complete the following statements :

(1) Heat transfers in a vacuum by and in solids by

(2) mineral is transparent, while mineral is translucent.

[B] (1) Write the balanced symbolic equation which expresses the reaction of calcium chloride solution with sodium sulphate solution, **Including** the physical states of the reactants and the products.

(2) **What is the importance of** DART radar system?

(3) **Rewrite the following equation after balancing :**



(4) **What is the effect of** dissolving glucose in water on the boiling and freezing points of water?

4 [A] Write the number that indicates each of the following :

(1) The number of carbon atoms in one glucose molecule.

(2) The number of water molecules resulting from the conversion of 2 glucose molecules to one maltose molecule.

[B] (1) What is meant by each of the following :

1- Thermal conductivity. 2- Melting process.

(2) **Identify the stage and the name of the reaction** that produces the largest amount of ATP energy in the cellular respiration process.

(3) **What is the result of** the divergence of two continental plates ?

Model 3

1 [A] Write the scientific term of each of the following :

(1) The fourth state of matter.

(2) A system in which both matter and energy are exchanged with the surroundings.

- [B] (1) **How does** ATP molecule convert to ADP molecule?
- (2) **Give an example for the minerals that are formed through :**
- 1- Magma solidification.
 - 2- Crystallization of hydrothermal vents solutions.
- (3) **Mention two factors** that affect the rate of evaporation.
-

2 [A] **Choose the correct answer :**

- (1) Liquids have
- (a) fixed volume and fixed shape.
 - (b) fixed volume and indefinite shape
 - (c) indefinite volume and fixed shape.
 - (d) indefinite volume and shape.
- (2) When air is heated ,
- (a) it expands and its density decreases, so it rises upward.
 - (b) it contracts and its density increases, so it rises upward.
 - (c) it expands and its density decreases, so it sinks downward.
 - (d) it contracts and its density increases, so it sinks downward.

[B] (1) **Sucrose, glucose and maltose are carbohydrates:**

- 1- **What** is the classification of both glucose and sucrose?
- 2- **Mention** a similarity and a difference between sucrose **and** maltose.
- 3- **How** can glucose sugar solution be detected?

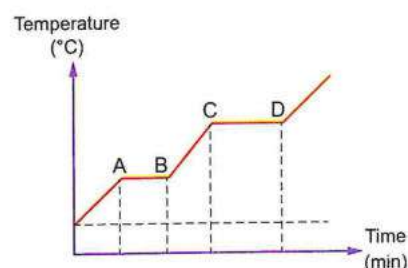
- (2) **Which one** gains heat faster, water or oil? **With explanation.**
-

3 [A] **Mark (✓) or (X) for each of the following statements, with correction :**

- (1) Infrared rays have a thermal effect. ()
- (2) The scientist Brown proved that oxygen is an essential element in the combustion process. ()

[B] (1) **The opposite figure shows the heating curve of water in its three fundamental states under certain conditions :**

- 1- **What is meant by** the melting of ice?
Which part in the graph represents it?
- 2- **Does** the values of temperature shown on the graph change when measured in high-altitude mountains? **With explanation.**



(2) **Give reasons for :**

- 1- Immersing plant leaves in boiling water before testing for the presence of starch.
- 2- Naming the tectonic earthquakes as such.

4 [A] Complete the following statements :

- (1) The changing of matter directly from the gaseous state to the solid state is known as as in the formation of
- (2) The internal energy of the system is the summation of and

[B] (1) Mention a similarity and a difference between halite **and** opal.

(2) **What happens when** dilute acetic acid is added to sodium bicarbonate?

(3) **Write the balanced symbolic equation which represents the following reaction, including the physical states of the reactants and the products and the reaction conditions :**

Heating mercury oxide powder strongly to produce mercury and oxygen.

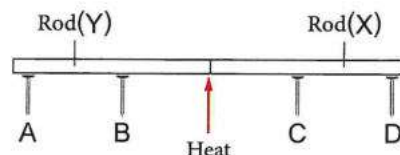
Model 4

1 [A] Choose from column (B) what suits it from column (A), and rewrite the statements completely :

(A)	(B)
Reaction	Is indicated by
(1) Rusting of iron	(1) colour change.
(2) Magnesium with acids	(2) formation of a precipitate.
	(3) formation of gas bubbles.

[B] (1) The figure shows an experiment in which four pins were fixed with identical wax pieces on rods (X) and (Y) of the same length and thickness :

- 1- **What** is the purpose of making this experiment?
- 2- **What** is the scientific explanation for the fall of pin (C) before pin (B)?
- 3- **What** do you conclude if pins (A) and (D) fall at the same time?



(2) **What is the role of** methylene blue solution in respiration experiments?

2 [A] Correct the underlined words:

- (1) The system's temperature represents the internal energy of its particles.
- (2) The African Great Rift is formed due to the formation of a new oceanic crust.

[B] (1) What happens when :

- 1- White light falls on a green leaf.
- 2- A massive meteorite falls on Earth's surface.
- 3- Cooling a hot supersaturated solution of sodium acetate.

- (2) **What happens when** carbon dioxide gas is passed through clear limewater solution? **Does this indicate** a physical or chemical change?
-

3 [A] Complete the following statements:

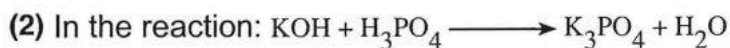
- (1) Fluids include substances and substances.
(2) Silver chloride is a precipitate, its colour turns when it is exposed to sunlight.

[B] What is the difference between each of :

- (1) Solids and gases (**In terms of** : The interparticle spaces).
(2) Iodine solution and Biuret solution (**In terms of** : Usage).
(3) Nile Delta soil and Oasis soil (**In terms of** : How does formation occurs).
(4) Catabolic processes and anabolic processes (**In terms of** : Energy).
-

4 [A] Choose the correct answer :

- (1) Which of the following is correct for all universal systems?
(a) They lose heat.
(b) They exchange energy with the surroundings.
(c) They gain heat.
(d) They are separated by boundaries from the surroundings.



The coefficient of KOH in the balanced equation is

- (a) 1 (b) 2 (c) 3 (d) 4

[B] (1) Give reasons for :

- 1- Starch is not formed in the part of the leaf covered by black tape.
2- The importance of vertical farming is increasing.

- (2) **What type** of chemical substance is cholesterol made of? **And what is the danger** of its increasing level in the blood?

Model 5

1 [A] Write the scientific term of each of the following statements:

- (1) The ability of the fluids to flow easily.
(2) A substance that increases the speed of a chemical reaction without being consumed or changed.

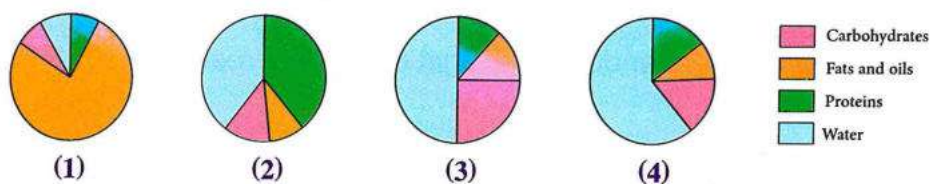
[B] (1) Rewrite the following equations after balancing :



- (2) **Explain the effect** of the concentration of CO_2 gas on the rate of photosynthesis.
- (3) **What do you observe when** a piston of a blocked nozzle syringe that contains air is pressed ?

2 [A] Choose the correct answer :

- (1) Each of the following factors affects the temperature of the system, **except**
- (a) its mass. (b) type of its substance.
(c) its shape. (d) its physical state.
- (2) The following pie charts illustrate the components of four different food samples, each weighing 100 g



Which of these samples stores the greatest amount of energy?

- (a) (1) (b) (2) (c) (3) (d) (4)

[B] Give reasons for :

- (1) The Red Sea is named as such.
- (2) The decrease in the boiling point of water at high altitudes.
- (3) It is preferred to use hollow clay bricks in building house facades.
- (4) Avoiding of touching the formed white powder immediately after burning a strip of magnesium.

3 [A] Mark (✓) or (X) for each of the following statements, with correction :

- (1) Hematite mineral is an iron oxide that is yellow in colour. ()
- (2) Nitrogen is an essential element in the formation of amino acids. ()

[B] (1) Place a plant pot next to a solution of methylene blue under a glass bell jar,
Explain what you observe in the presence and absence of light,
with explanation.

(2) Does the relative stability of the sea water temperature mean that it does not absorb thermal energy? **Explain.**

(3) Apply the concept of chemical reaction to the reaction of sodium hydroxide with hydrochloric acid to form sodium chloride and water.

4 [A] Complete the following statements:

- (1) During frying eggs, a change happen in the and of the white and the yellow parts, indicating that a chemical reaction has occurred.
- (2) The scientist assumed hypothesis based on his observation of the development of the world map over time.

[B] (1) The container (A) contains one liter of boiling water, and the container (B) contains half a liter of boiling water. **What happens when** both containers touch each other in terms of heat transfer? **With explanation.**

- (2) **What is the effect of** increasing humidity on the rate of evaporation of liquids?
- (3) **What happens** to water during the light dependent reactions of photosynthesis?
- (4) **What is meant by** mineral?

Model 6

1 [A] Correct the underlined words:

- (1) The interparticle spaces between liquid molecules are equal to the interparticle spaces between gas molecules.
- (2) Cans of soft drinks represent an open system.

[B] (1) **How is each of the following formed:**

1- Mount Al-Kamel crater.

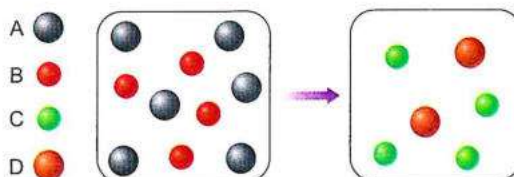
2- Harrat Rahat Mountain.

(2) **Explain** how heat is transferred in gases by convection currents.

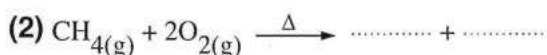
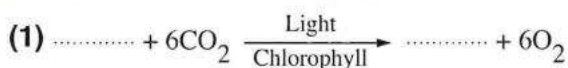
(3) **The opposite figure** illustrates the reaction

between molecules of substance (A)
with molecules of substance (B)
to form the two substances (C) and (D)

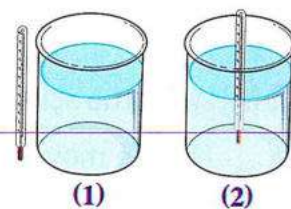
**Write the balanced symbolic equation
which represents this reaction.**



2 [A] Complete the following equations:



[B] (1) The opposite figures show two beakers containing two equal masses of water at the same temperature (60°C):



1- How is heat transferred to the thermometer in each case?

2- Compare the average kinetic energy of water particles in the two beakers, with explanation.

(2) What do you observe when a fruit is left in humid air for a long time?

(3) What is the importance of animal bones in the food industries?

3 [A] Choose the odd word out, then write the relation between the rest:

(1) Butter / Flour / Grapes / Rice.

(2) Opal / Quartz / Halite / Olivine.

[B] (1) Ethane gas (C_2H_6) burns in pure oxygen to give the same products of methane combustion:

1- Write the equation of ethane combustion in a way that verifies the law of conservation of mass.

2- How can the gas produced from this reaction be identified ?

(2) Compare between solids and liquids (in terms of : Fluidity).

(3) What is the substance which is used in the treatment of diabetes, and what is the technique used in its manufacture?

4 [A] Choose the correct answer :

(1) Which of the following is correct about the cellular respiration process?

(a) It occurs in three stages.

(b) The first stage takes place in the cytoplasm.

(c) Krebs cycle reactions take place in the cytoplasm.

(d) CO_2 gas is produced in the first stage.

(2) All the following are soil components, except

(a) water.

(b) clay.

(c) ozone.

(d) humus.

[B] (1) The water cycle in nature includes four main processes:

1- Mention two reversible processes of these processes.

2- Mention two processes that require the absorption of thermal energy.

(2) Describe the inner membrane of a mitochondrion, and mention its functional suitability.

(3) How were the Japanese islands formed by the tectonic plates movement?

Model 7

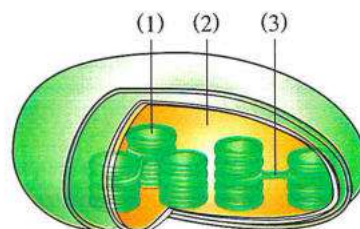
1 [A] Write the scientific term of each of the following:

- (1) The movement of the tectonic plates parallel to each other.
- (2) The coffee that dissolves quickly in water.

[B] (1) The opposite figure represents one of the cell organelles:

1- Does this organelle exist in all living cells?
Explain.

2- Replace the numbers shown in the figure with the appropriate labels.



- (2) **Compare between** the boiling points of distilled water **and** the water containing a spoon of glucose sugar dissolved in it at normal atmospheric pressure.
- (3) **What is the importance of** silver in computers? **"Based on what you have studied"**.

2 [A] Choose the correct answer:

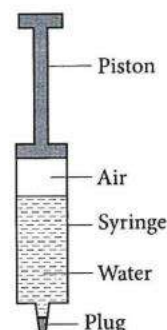
- (1) An experiment was conducted by heating two equal masses of water and ice by using the same heat source.
Which of the following represents the dependent variable?
 - (a) The equality of the two masses.
 - (b) The difference in the type of the two substance.
 - (c) The difference in the rate of change in temperature in the two masses.
 - (d) The equality of the amount of the gained heat.
- (2) A white precipitate is formed when sodium chloride solution is added to

(a) silver nitrate solution.	(b) acetic acid solution.
(c) sodium bicarbonate solution.	(d) copper sulphate solution.

[B] (1) From the opposite figure:

1- What is the difference between the attraction forces found between the particles of each of the two fluids shown in the figure?

2- What happens to the volume of both water and air when pressed the syringe piston?



(2) Write the balanced symbolic equation which represents the following reactions, including the physical states of the reactants and the products:

- 1- The reaction of barium chloride solution with sodium sulphate solution to form sodium chloride solution and a precipitate of barium sulphate.
- 2- The reaction of magnesium with dilute hydrochloric acid.

3 [A] Mark (✓) or (X) for each of the following statements, with correction :

- (1) The specific heat of mercury is greater than that of water. ()
- (2) The formation of glycogen from glucose represents a catabolic process. ()

[B] (1) Explain the scientific basis for the sea breeze phenomenon.

(2) What are the observations which can prove that the burning of sugar represents a chemical reaction?

(3) Carbohydrates are chemical nutrients :

1- Mention two sources of carbohydrates.

2- Explain the importance of carbohydrates for plant cell walls.

4 [A] Complete the following statements:

(1) of wax represents a physical change, while of wax represents a chemical change.

(2) Magma rich in magnesium and iron forms minerals when it solidifies such as,

[B] (1) What is the property that helps us to recognize each mineral of the following:

1- Galena.

2- Pure quartz.

(2) What role do proteins play in:

1- Laundry detergents.

2- Supporting the immune system.

Model 8

1 [A] Give one example for each of the following:

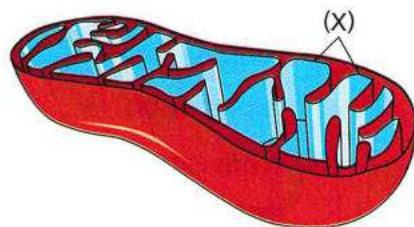
(1) Transported soil.

(2) Thermal insulator substance.

[B] (1) The opposite figure represents one of the cell organelles:

1- What is the name of this organelle, and what is the biological process that occurs in it?

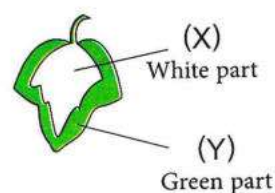
2- Explain the cause and effect in the structural adaptation of the membrane (X).



(2) The opposite figure illustrates the shape of a plant leaf :

1- **What** is the pigment that causes the green colour in the leaf?

2- **Identify** the part that turns dark blue when we use an indicator to detect the starch in the leaf, **with explanation**.



2 [A] Correct the underlined words :

(1) Hematite mineral is one of the ores of copper.

(2) Ionized gases represent the fourth state of matter, which is albumin.

[B] Explain the relation between each of :

(1) The pressure cooker **and** energy preservation.

(2) The mass of the substance **and** the amount of change in its temperature when heated.

(3) The luster of objects **and** their ability to reflect infrared rays.

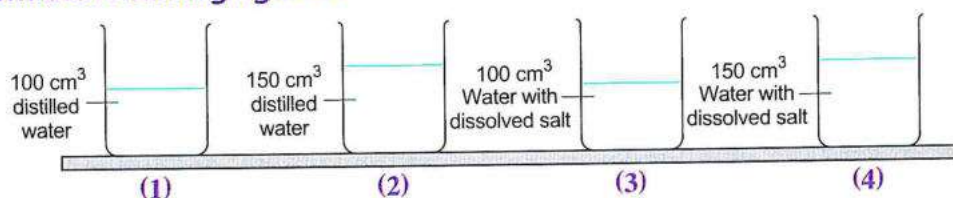
(4) Fireworks **and** chemical changes.

3 [A] Complete the following statements:

(1) Fructose sugar is a , while starch is a

(2) The cause collapses, and Earth cracks.

[B] (1) From the following figures :

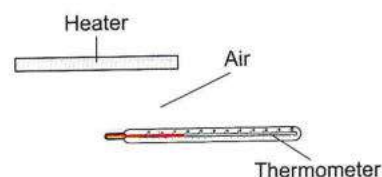


When the content of each container is heated with the same heat source for the same period of time. **In which case** the boiling point will be the highest ? **With an explanation**.

(2) **Why** is the falling of sugar granules from a punctured bag not considered fluidity?

(3) Pumping air slowly into a car tire does not raise the temperature. **Does the average** kinetic energy of air molecules **increase or remain unaffected?** **With explanation**.

(4) **What is (are) the method(s)** by which heat is transferred from the heater to the thermometer as shown in the opposite figure?



4 [A] Write the scientific term for each of the following:

- (1) The form in which excess sugar is stored in the liver.
- (2) The boundary lines at which the tectonic plates converge.

[B] (1) Dilute acetic acid reacts with sodium bicarbonate to form sodium acetate salt, water, and carbon dioxide gas:

- 1- **How** can this reaction be indicated?
 - 2- **How** can the evolution of CO_2 gas be detected chemically?
 - 3- **How** can a supersaturated solution of sodium acetate be prepared?
- (2) **Rewrite the following word equation in symbolic form, including the physical states of the reactants and the products:**

Hydrogen sulphide solution + Sulphur dioxide gas $\longrightarrow$ Solid sulphur + Water

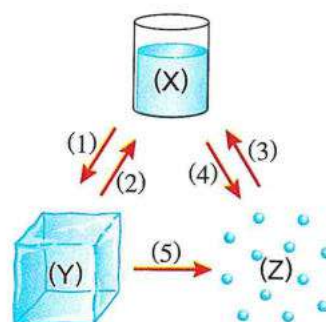
Model 9

1 [A] Choose the correct answer:

- (1) The stems of potatoes contain plastids which are.....
 - (a) green only.
 - (b) colourless only.
 - (c) green and red.
 - (d) coloured and colourless.
- (2) Chloroplasts are similar to mitochondria in having
 - (a) cristae.
 - (b) double membrane.
 - (c) thin membranes.
 - (d) grana thylakoids.

[B] Study the opposite figure, then answer the following :

- (1) **Identify** the symbol of the substance whose molecules possess the highest kinetic energy, **and Describe** the attraction forces between its molecules.
- (2) **What** is the process expressed by the number (5)? **Give an example** for a substance that undergoes this process.



- (3) **Identify** the numbers of all the processes that are accompanied by gaining thermal energy.
- (4) **Clarify** the direction of heat transfer when both substances (X) and (Y) come in touch with each other.

2 [A] Mark (✓) or (X) for each of the following statements, with correction :

- (1) In the cellular respiration, glucose is hydrolyzed in the mitochondria. ()
- (2) Fatty acids are the building units of proteins. ()

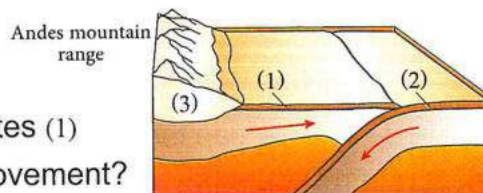
[B] (1) This opposite figure shows

how the Andes mountain range was formed :

1- What is the type of each of the two plates (1) and (2), and **what is the type** of their movement?

2- What is the type of the crust (3) ?

With explanation.



(2) **Why can** a container its volume is 100 cm^3 hold 120 cm^3 of air but it cannot hold 120 cm^3 of water?

(3) **What is the mass** of magnesium oxide produced from the combination of 2.4 g of magnesium with 1.6 g of oxygen? **With explanation.**

3 [A] Choose from column (B) what suits it in column (A), and rewrite the statements completely:

(A)	(B)
(1) Sulphur is a mineral	(1) Is rich in silica.
(2) Mica is a mineral	(2) Is a yellow-coloured element.
	(3) Is rich in magnesium and iron.

[B] (1) Write the chemical equation indicating the transformation of ADP molecule into ATP molecule.

(2) **What is meant by** the specific heat of iron equals $450 \text{ J/kg}^\circ\text{C}$?

(3) **What plant** did the scientist Helmont use in his experiment, **and What are the changes** which he observed after 5 years from the start of his experiment ?

(4) **What is the danger** of the excessive intake of dietary supplements rich in amino acids ?

4 [A] Choose the correct answer:

(1) The reaction of zinc with copper sulphate solution is indicated by

- (a) the change in the colour of the solution and the formation of bubbles.
- (b) the formation of gas bubbles only.
- (c) the disappearance of the colour of the solution and formation of a precipitate.
- (d) the formation of a white substance.

(2) Three samples of equal masses of ice (at -5°C) and aluminum (at 20°C) and water (at 20°C), were supplied with the same amount of thermal energy. What is the correct arrangement of the fastest temperature change ?

- (a) Aluminum then water then ice. (b) Aluminum then ice then water.
(c) Ice then water then aluminum. (d) Water then aluminum then ice.

[B] (1) **Where** is it preferred to place the space heater in the room? **Explain**.

(2) **What** are the substances which react with each other to form soap?

(3) **Balance the following equation:** $\text{Fe}_3\text{O}_4 + \text{H}_2 \longrightarrow \text{Fe} + \text{H}_2\text{O}$

(4) **Explain the relation between** the rate of gas diffusion **and** the mass of its molecules.

Model 10

1 [A] **Choose the odd word (or statement) out, then write the relation between the rest:**

(1) Sublimation / Boiling / Deposition / Melting.

(2) They spread in space / Their speed is 300,000 km/s / They have a thermal effect / Visible waves.

[B] (1) **The opposite figure** shows two continents when they started to separate from each other. **What are these two** continents, **and when** did they begin to separate from each other?

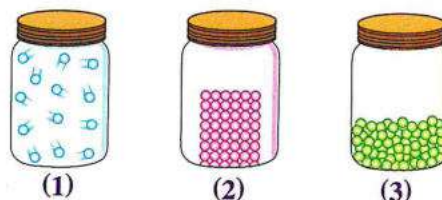


(2) **What is meant by** enzymes?

(3) **The opposite figure represents the particles of matter in its three states :**

1- **What** is the physical state of matter when it is in state (3)?

2- **Explain** how the movement of particles of matter determines its physical state.



2 [A] **Complete the following statements:**

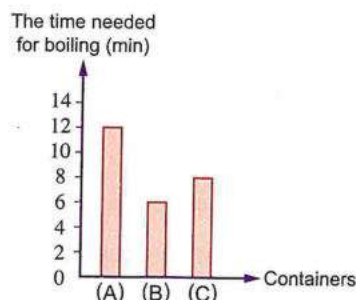
(1) Iron when it is exposed to moist air, and this is a change.

(2) It is recommended to reduce consumption of white carbohydrates such as

[B] (1) **Three different amounts of water were heated in three identical containers, and the opposite graph represents the time taken for each amount to reach boiling point:**

1- **Which** of these containers contains the least amount of water?

2- **What are the independent variable and the controlled variable** in this experiment?



(2) In the following reaction :

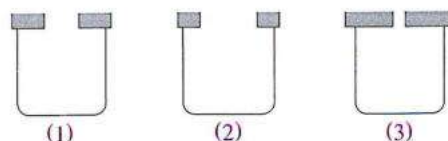
Magnesium + Dilute sulphuric acid $\longrightarrow$ Magnesium sulphate solution + Hydrogen

- 1- **Write** the balanced symbolic equation of the chemical reaction, **including** the physical states of the reactants and the products.
- 2- **Calculate** the mass of dilute sulphuric acid needed to react with 24 g of magnesium to produce 120 g of magnesium sulphate and 2 g of hydrogen.

3 [A] Write the scientific term of each of the following statements:

- (1) The process of converting protein molecules into molecules of amino acids.
- (2) The decomposed organic matter present in the soil.

[B] (1) The containers shown in the opposite figure contain equal amounts of water:



1- **Why** do the amounts of water in the three containers decrease after several hours?

2- **Which of these** containers has the least amount of water after several hours? **with explanation.**

- (2) **Why is it advised** to lie on the ground when smoke from a fire spreads in a closed space?
- (3) **What is the difference between** physical change **and** chemical change of substances?

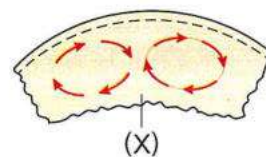
4 [A] Correct the underlined words:

- (1) Glucose absorbs the energy of red and blue light in photosynthesis.
- (2) In the first stage of cellular respiration, each glucose molecule is converted into 2 molecules of adenosine.

[B] (1) The opposite figure represents the movement of magma in the layer (X) of Earth.

What is the way in which magma moves in the layer (X)?

And what is the name of this layer?



- (2) An egg, a spoonful of starch, and water were placed in the blender to make a liquid mixture.

Mention three reagents that give positive results with the nutritional components in this mixture.

- (3) **How** were the Hawaiian Islands formed?

Model 1

1

(A) (1) c

(2) a

- (B) (1) The number of mitochondria increases in cells that require a large amount of energy, such as muscles and liver cells.
- (2) The increase in pressure due to the trapping of water vapour inside the pressure cooker reduces cooking time, which helps to save energy.
- (3) A deficiency in the pancreas secretion of insulin hormone causes diabetes.
- (4) Photosynthesis occurs only in chloroplasts because they contain chlorophyll pigment.

2

(A) (1) ✓ (2) ✓

- (B) (1) The tectonic plates move in a slow, continuous motion that is not noticeable relative to each other.
- (2) Thermal insulation increases, preventing people inside the building from feeling external temperature changes, which reduces air conditioning costs inside the buildings.
- (3) A white precipitate of silver chloride is formed, which turns violet when it is exposed to sunlight.
- (4) A red-orange colour is formed on the surface of the mixture containing fats.

3

(A) (1) blue / colourless.

(2) be compressed / diffuse.

(B) (1) $2C + O_2 \longrightarrow 2CO$

- (2) Sand / Because the specific heat of sand is lower than that of water.
- (3) Sodium hydroxide and calcium oxide / Used for absorbing CO_2 gas.
- (4) Evaporation process occurs at any temperature, while the boiling process occurs at a certain temperature (boiling point).

4

(A) (1) Sublimation.

(2) Chemical reaction.

(B) (1) $2H_2O_{(l)} \longrightarrow 2H_{2(g)} + O_{2(g)}$

- (2) Substances that has fluidity property and take the shape of their container.
- (3) He concluded that water is a key element in the growth of plants.
- (4) Residual sedentary soil, formed from the slow weathering of sandy and limestone rocks in the same place.

Model 2

1

(A) (1) catalysts.

(2) monosaccharide.

(B) (1) 1. (1): The liquid state,

(2): The solid state,

(3): The gaseous state.

2. Particles of the substance vibrate in their fixed position without moving to another position.

(2) **Before burning:** A white solid, odourless substance.

After burning: A black substance with the evolution of smoke and a strong odour.

- (3) When a damp (wet with water) universal indicator strip is brought close to the mouth of the tube, its colour changes.

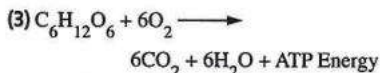
2

(A) (1) (c) (2) (d)

(B) (1) 1. A cooling system that protects cars engines from damage due to high temperatures.

2. Water, as it is an excellent cooling liquid due to its high specific heat.

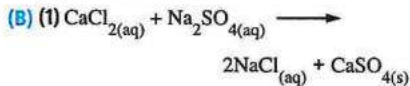
(2) It is composed of structural units called thylakoids, their number is 15 or more / Light dependent reactions occur in it.



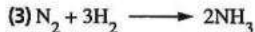
3

(A) (1) radiation / conduction.

(2) Quartz / mica.



(2) It changes the orbit of some meteorites to protect Earth from meteorite collisions.



(4) The boiling point will be higher than 100°C and the freezing point will be lower than 0°C

4

(A) (1) 6 atoms. (2) 1 molecule.

(B) (1) Answer by yourself.

(2) The second stage in electron transport chain reactions.

- (3) A new oceanic crust or new continental crust is formed.

Model 3

1

(A) (1) Plasma state. (2) Open system.

(B) (1) By losing one phosphate group.

(2) 1. Mica. 2. Apatite.

"Or any other correct answer."

(3) Temperature and surface area of the liquid.

"Or any other correct answer."

2

(A) (1) (b) (2) (a)

(B) (1) 1. • Glucose is a monosaccharide.
• Sucrose is a disaccharide (oligosaccharides).

2. • **Similarity:** Both are disaccharides (oligosaccharides).

• **Difference:** Sucrose is composed of one glucose unit and one fructose unit, while maltose is composed of two glucose units.

3. By using Benedict's solution, which turns from the blue colour into green, orange, or red colour depending on the concentration of glucose.

(2) Oil, due to its lower specific heat compared to that of water.

3

(A) (1) ✓

(2) The scientist Antoine Lavoisier proved that

(B) (1) 1. Its the changing from the solid state to the liquid state / Part AB

2. Yes / Because on high-altitude mountains, the atmospheric pressure decreases, which decreases the boiling point and increases the freezing point.

(2) 1. To break down the cell walls.

2. Because they occur at the boundaries of tectonic plates due to the movement of the tectonic plates.

4

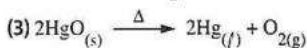
(A) (1) deposition / frost.

(2) kinetic energy / potential energy.

(B) (1) • **Similarity:** Both have a specific chemical composition.

• **Difference:** Halite has a definite crystalline structure, while opal is not crystalline.

(2) A chemical reaction occurs, indicated by the occurrence of effervescence and the evolution of bubbles of CO_2 gas.



Model 4

1

(A) $(1 / 1) \times (2 / 3)$.

(B) (1) 1. To investigate the difference in the thermal conductivity between (X) and (Y) rods.

2. The thermal conductivity of rod (X) is better than that of rod (Y).

3. Rods (X) and (Y) are made of the same substance.

(2) Indicating the consumption of O_2 in the process of cellular respiration.

2

(A) (1) the average kinetic energy.

(2) The Red Sea.

(B) (1) 1. The leaf absorbs all colours of white light and reflects only green light.

2. A massive circular crater is formed.

3. Crystals of sodium acetate are formed.

(2) Clear limewater turns milky, indicating a chemical change.

3

(A) (1) liquid / gaseous.

(2) white / violet.

(B) (1) The interparticle spaces between solid particles are very small, while they are very large between gaseous particles.

(2) Iodine solution is used to detect starch, while Biuret solution is used to detect proteins.

(3) Nile Delta soil was formed by the transport of rock fragments from the Ethiopian plateau by the Nile River, while Oasis soil was formed by the slow weathering of sandy and limestone rocks in the same place.

(4) Catabolic process is accompanied by the release of energy, while anabolic process is accompanied by the consumption of energy.

4

(A) (1) (d)

(2) (c)

(B) (1) 1. Due to the absence of light, so photosynthesis does not take place in this part.

2. To provide a sustainable solution to the problem of lacking arable land.
- (A) A fat substance / Its deposition on walls of the arteries leads to their blockage and increases the risk of heart diseases.

Model

5

- 1
 - (A) (1) Fluidity. (2) Catalyst.
 - (B) (1) $4\text{NH}_3 + 5\text{O}_2 \longrightarrow 4\text{NO} + 6\text{H}_2\text{O}$
 2. $\text{PCl}_5 + 4\text{H}_2\text{O} \longrightarrow \text{H}_3\text{PO}_4 + 5\text{HCl}$
 - (2) The rate of photosynthesis increases with increasing the concentration of CO_2 gas up to 0.1%, after that its rate becomes constant.
 - (3) The air is compressed (its volume decreases).

- 2
 - (A) (1) (c) (2) (a)
 - (B) (1) Because the presence of plenty of red algae and the reflection of the red colour of mountains and rocks on its shores.
 - (2) Due to the decrease in atmospheric pressure, where the temperature decreases by 1°C for every 300 m of altitude.
 - (3) Because the thermal conductivity of the air in the hollow of the bricks is low, which leads to thermal insulation.
 - (4) Because it becomes very hot after the chemical reaction.

3

(A) (1) red in colour.

(2) ✓

(B) (1) • In the presence of light, the colour of the methylene blue solution does not change, due to the oxygen produced from the process of photosynthesis.

- In absence of light, the colour of the methylene blue solution disappears, as oxygen is consumed in the process of respiration.

(2) No / Because during the processes of melting and boiling, the temperature remains constant despite the absorption of thermal energy, as the absorbed thermal energy weakens the attraction forces between the particles of the substance.

(3) The bonds between the atoms of the reactant molecules (sodium hydroxide and hydrochloric acid) are broken, and new bonds are formed between the atoms to create the product molecules (sodium chloride and water).

4

(A) (1) colour, texture.

(2) Wegener / continental drift.

(B) (1) No heat transfer occurs, as the temperatures of the water in the two containers are equal.

(2) The rate of evaporation decreases.

(3) It decomposes into hydrogen and oxygen.

(4) Answer by yourself.

Model 6

1

(A) (1) less than. (2) a closed.

(B) (1) 1. As a result of a meteorite fall on the surface of Earth in the Western Desert of the New Valley Governorate.

2. As a result of volcanic activity in Saudi Arabia.

(2) Hot air (of lower density) rises and is replaced by cold air (of higher density).

(3) $3A + 2B \longrightarrow 2C + D$

2

(A) (1) $6H_2O / C_6H_{12}O_6$

(2) $CO_{2(g)} / 2H_2O_{(v)}$

(B) (1) (1) : By convection or radiation.

(2) : By conduction.

2. The average kinetic energies of water particles in the two beakers are equal due to their equal temperatures.

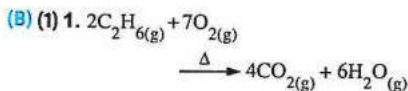
(2) A chemical change occurs that causes it to go rotten.

(3) Gelatin, used in food industries, is extracted from animal bones.

3

(A) (1) Butter / Sources rich in carbohydrates.

(2) Opal / Minerals.



2. When CO_2 gas passes through clear limewater, it turns milky.

(2) Solids do not have fluidity property, unlike liquids.

(3) Insulin / Genetic engineering technology.

4

(A) (1) (b) (2) (c)

(B) (1) 1. Evaporation and condensation (or melting and freezing).

2. Evaporation and melting.

(2) Folded forming folds (cristae) to increase the inner surface area of the mitochondrion to produce more energy.

(3) They are formed through the convergence of two oceanic plates.

Model 7

1

(A) (1) Transform movement.

(2) Instant coffee.

(B) (1) 1. No / Because it represents the chloroplast, which is found only in the green parts of plants and in green algae.

2. (1): Thylakoids of grana.

(2): Stroma.

(3): Thin membrane.

(2) The boiling point of distilled water ($100^\circ C$) is less than the boiling point of water with dissolved glucose sugar at normal atmospheric pressure.

- (3) It is used in cooling systems to dissipate excess heat.

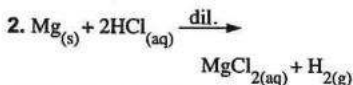
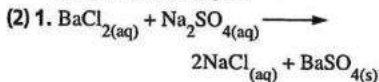
2

(A) (1) (C)

(2) (A)

(B) (1) 1. The attraction forces between water molecules are stronger than those between air molecules.

2. The volume of air decreases, while the volume of water remains unchanged.



3

(A) (1) less than that of water.

(2) an anabolic process.

(B) (1) The rising of hot air in contact with the land to a higher altitude, to be replaced by the cold air coming from the sea.

(2) Its colour changes, evolution of smoke and strong odour.

(3) 1. Bread and potatoes "or any other correct answer".

2. The formation of cellulose, which is a component of plant cell walls.

4

(A) (1) melting / combustion.

(2) olivine / pyroxene.

(B) (1) 1. Luster (shining).

2. Transparency.

(2) 1. Formation of enzymes that remove stains.

2. Formation of antibodies that support the immune system against the disease-causing microbes.

Model

8

1

(A) (1) Nile Delta soil.

(2) Polystyrene.

(B) (1) 1. Mitochondrion, cellular respiration process.

2. • **Cause:** The inner membrane of the mitochondrion forms folds that increase its inner surface area.

• **Effect:** This enhances energy production during the cellular respiration process with high efficiency.

(2) 1. Chlorophyll pigment.

2. (Y) / Because this part carries out photosynthesis and produce glucose which is converted into starch, which in turn causes iodine to turn dark blue.

2

(A) (1) iron.

(2) plasma state.

(B) (1) The trapping of water vapour inside a pressure cooker leads to increasing the pressure inside it, which decreases the cooking time and saves fuel (energy).

(2) The amount of change in the temperature of a substance increases as its mass decreases.

(3) The ability of objects to reflect infrared rays increases with increasing their brightness (light colours).

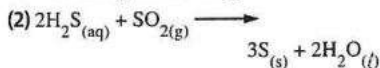
(4) When fireworks are lit, a chemical reaction occurs, accompanied by emission of light and heat.

3

- (A) (1) monosaccharide/ polysaccharide.
 (2) earthquakes/ landslide.
- (B) (1) Container (3) / Because it contains impurities in the form of table salt in addition to having a lower mass (due to its smaller volume) than that of water in container (4).
 (2) Because they are solid substances and their falling does not change their shape.
 (3) The average kinetic energy of air molecules is not affected as the temperature does not change.
 (4) Radiation or convection.

4

- (A) (1) Glycogen.
 (2) Convergent boundaries.
- (B) (1) 1. Effervescence and the evolution of gas bubbles of carbon dioxide occur.
 2. Clear limewater turns milky when CO_2 gas passes through it.
 3. A large quantity of salt is added to a small volume of water with heating and stirring.



Model

9

1

- (A) (1) (b) (2) (b)
- (B) (1) The substance (Z) has very weak attraction forces between its molecules.

- (2) Sublimation / Dry ice (or solid iodine).
 (3) (2), (4), (5).
 (4) Heat transfers from (X) to (Y) until reaching thermal equilibrium.

2

- (A) (1) in the cytoplasm.
 (2) Amino acids are
- (B) (1) 1. Plate (1): Continental plate.
 Plate (2): Oceanic plate.
 • Convergent movement.
 2. Continental crust / Because there is a land above it.
 (2) Because air is compressible, unlike water.
 (3) 4 g / Because according to the law of conservation of mass, the total mass of the reactants is equal to the total mass of the products.

3

- (A) $(1/2) \cdot (2/1)$.
- (B) (1) $\text{ADP} + \text{P} \longrightarrow \text{ATP}$
 (2) It requires 450 J to raise the temperature of 1 kg of it by 1°C
 (3) The willow tree / He noticed a significant increase in the mass of the sapling while slight decrease in the mass of the soil.
 (4) The liver and kidneys are exposed to serious risks.

4

- (A) (1) (c) (2) (b)
- (B) (1) It is preferred to place it on the room floor to ensure good heat distribution, as the space heater warms the surrounding air, causing the hot air to rise and cooler air to move down to be heated.

(2) Oil with caustic soda solution.



(4) The speed of gas diffusion increases as the mass of its molecules decreases, and vice versa.

Model 10

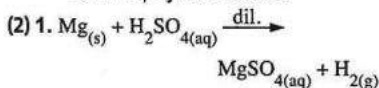
- 1
- (A) (1) Deposition / changes that are accompanied by gaining of heat.
- (2) Visible waves / Properties of the infrared rays.
- (B) (1) Africa and South America began to separate approximately 135 million years ago.
- (2) Proteins that act as catalysts in the reactions occurring in the cells of living organisms without the need for heating.
- (3) 1. The liquid state.
2. When the molecules of a substance vibrate in the fixed position, they are in the solid state, and when the movement of the molecules is random in all directions, they are in the gaseous state, but the molecules of liquids move only within the container in which they are placed.

- 2
- (A) (1) rusts / chemical.
- (2) white sugar / white flour.

(B) (1) 1. Container (B).

2. • **Independent variable:** Mass of the liquid.

• **Controlled variables:** Identical containers, type of substance, and its physical states.



2. Mass of products =
 $120 + 2 = 122 \text{ g}$
Mass of sulphuric acid =
 $122 - 24 = 98 \text{ g}$

3

(A) (1) Catabolism.

(2) Humus.

(B) (1) 1. Due to the evaporation of surface water molecules.

2. Container (2) / Due to increasing the surface area exposed to evaporation.

(2) Because the hot air rises and is replaced by cold air.

(3) A physical change does not involve a change in the chemical composition of substances, unlike a chemical change.

4

(A) (1) Chlorophyll.

(2) pyruvic acid.

(B) (1) Convection currents, upper mantle.

(2) Sudan (IV) solution, Biuret solution, and iodine solution.

(3) Due to volcanic activity.

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



خطوة 1



خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6

حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الاول



Prep 2 Final Revision on unit 1

1) Choose the correct answer:

- 1- Compression of matter means that it.....
 - a) changes from one state to another
 - b) changes its mass
 - c) changes the size of its particles
 - d) reduces its volume
- 2-has a definite shape.
 - a) Air
 - b) Oil
 - c) Ice
 - d) Water
- 3- Air and water are similar in that they both.....
 - a) have mass
 - b) can be seen
 - c) have a fixed shape
 - d) have a fixed volume
- 4-can flow.
 - a) wood and iron
 - b) water and oxygen
 - c) glass and water
 - d) oil and wood
- 5- Air is characterized by it has
 - a) no mass
 - b) a definite shape
 - c) a definite volume
 - d) no definite shape
- 6- Diffusion in occurs with an average speed.
 - a) wood
 - b) iron
 - c) water
 - d) air
- 7- The common property of glass and water is that both.....
 - a) have fixed volume
 - b) have fixed shape
 - c) can flow
 - d) can be compressed
- 8- are considered fluids.
 - a) Ice and liquid water.
 - b) Oil and iron.
 - c) Water vapor and liquid water.
 - d) Iron and water vapor.
- 9- Iron is characterized by having.....
 - a) no fixed volume or shape
 - b) a fixed shape and no fixed volume
 - c) a fixed shape and volume
 - d) a fixed volume and no fixed shape
- 10- As viscosity of liquids increases, the ability of liquids to flow.....
 - a) increases
 - b) doubled
 - c) decreases
 - d) doesn't change
- 11- Thestate is used in air conditioners to improve air quality in enclosed spaces.
 - a) solid
 - b) liquid
 - c) gas
 - d) plasma

- 12-** Change in.....refers to transfer energy from or to the system.
a) mass b) state c) pressure d) temperature
- 13-** The speed of the matter particles increases during.....processes.
a) Melting and freezing b) Freezing and boiling
c) Evaporation and condensation d) Melting and evaporation
- 14-** If the freezing and boiling points of substance (X) are 110 °C and 190°C respectively, so the state of this substances at 80°C is.....
a) solid b) liquid c) gas d) plasma
- 15-** When a solid substance melts, its particles.....
a) keep vibrating around their positions.
b) stop vibrating.
c) move more freely and randomly in all directions.
d) are released from their fixed positions.
- 16-** The boiling point of water at the top of a mountain its height equals 1800 m is.....
a) 100 b) 94 c) 90 d) 80
- 17-** The kinetic energy of matter particles decreases during..... andprocesses.
a) condensation and freezing b) freezing and boiling
c) Evaporation and melting d) freezing and evaporation
- 18-** andprocesses are accompanied by gaining thermal energy.
a) Melting and freezing b) Freezing and boiling
c) Evaporation and condensation d) Melting and evaporation
- 19-**is the temperature at which all liquid particles overcome the attractive forces between them and converts to the gaseous state.
a) melting point b) freezing point
c) boiling point d) no correct answer
- 20-** Water molecules have the lowest kinetic energy when it is in the form of.....
a) ice b) water drops c) water vapor d) steam

- 21-** Melting process is the reverse process of.....
- a) boiling b) freezing c) evaporation d) condensation
- 22-** Objects with more thermal energy have.....kinetic energy.
- a) more b) less c) the same d) no
- 23-** The change of matter from the gaseous state to the solid state directly without passing through the liquid state is called.....process.
- a) evaporation b) freezing c) condensation d) deposition
- 24-** When boiling a certain volume of water, a larger volume of vapor is produced, because.....
- a) The vapor particles are farther away compared to that of water.
b) The structure of water differs from that of vapor.
c) Water particles collide upon boiling.
d) water boiling increases the number of particles.
- 25-** The formation of frost represents.....process.
- a) evaporation b) freezing c) condensation d) deposition
- 26-** All the followings express water transformations except.....
- a) physical processes. b) chemical processes.
c) reversible processes. d) accompanied by thermal changes.
- 27-** The same change in physical state occurs in the processes of.....
- a) Melting and freezing b) Freezing and boiling
c) Evaporation and boiling d) Melting and evaporation
- 28-** The boiling point of water at the highest peak of mountain whose altitude is 3000 m is.....°C.
- a) 100 b) 94 c) 90 d) 80
- 29-** When table salt is dissolved in distilled water.....
- a) the melting point increases. b) the boiling point increases.
c) the boiling point decreases. d) the melting point doesn't change.
- 30-** The rate of liquid evaporation increases by increasing all of the followings except.....
- a) temperature. b) surface area.
c) humidity. d) speed of air currents.

- 31-** When the internal energy of the system increases,.....
- a) the temperature decreases. b) the temperature increases.
c) the temperature remains the same. d) The particles stop moving.
- 32-** When a substance is heated, its particles.....
- a) average kinetic energy decreases. b) potential energy increases.
c) average kinetic energy increases. d) internal energy decreases.
- 33-** When two identical copper cubes come into contact, the temperature of the first cube is 60°C and the second is 40°C , their temperatures will be $^{\circ}\text{C}$ at the thermal equilibrium.
- a) 30 b) 50 c) 70 d) 100
- 34-** When stirring a cup of hot tea using a metal spoon, heat transfers to the hand by.....
- a) conduction. b) convection. c) radiation. d) b & c.
- 35-** All the following are good heat conductors, except.....
- a) iron. b) copper. c) aluminum. d) wood.
- 36-** We can distinguish easily between the thermal conductivity of.....
- a) iron and copper. b) copper and aluminum.
c) wood and plastic. d) iron and plastic.
- 37-** During ironing clothes with an electric iron, heat transfers from the base of the iron to the clothes by.....
- a) conduction. b) convection. c) radiation. d) b & c.
- 38-** Heat transfers by convection in all the following, except
- a) chlorine. b) water. c) air. d) aluminum.
- 39-** When air heats up, its density.....
- a) decreases and it goes down. b) decreases and it rises up.
c) increases and it goes down. d) increases and it rises up.
- 40-** The effect of sea breeze is more perceptible in.....
- a) summer. b) spring. c) winter. d) autumn.
- 41-** Houses in hot countries are painted with white colour because white surfaces.....
- a) reflect radiation. b) transfer radiation.
c) let radiation pass through them. d) absorb radiation.

2) Complete the following statements:

- 1-materials can flow and can be compressed, whilematerials can flow and can't be compressed.
- 2- Diffusion throughmaterials is very fast, while diffusion throughmaterials is very slow.
- 3- The speed of diffusion increases by increasing theof the diffusion medium.
- 4- Fluids are substances that are inorstates.
- 5- When flow occurs, the volume of thematerials doesn't change, while the volume of thematerials change.
- 6- The particles of a substance haveenergy due to their continuous motion, while they haveenergy due to forces of attraction between them.
- 7- The flow of liquids varies according to their
- 8- The speed of diffusion through solids isthe speed of diffusion through liquids.
- 9- The interparticle spaces between iron particles are, while they arebetween hydrogen particles.
- 10- The attractive forces between particles are greatest in thematerials, while almost not exist inmaterials.
- 11- The scientistdiscovered the random movement of particles suspended in, which is known asmotion.
- 12-occurs as a result of collisions between relatively large particles and fluid particles.
- 13- There is a fourth state of matter known as, and it is found in outer space such as matter found in the, stars and cosmic
- 14-is used in air conditioners to purify air by..... harmful pollutants, germs and viruses.
- 15- When matterthermal energy, so the kinetic energy of its particles increases, leads to an increase in its
- 16- At melting point, matter exists in bothand states at the same temperature.

- 17-andprocesses are accompanied by losing thermal energy.
- 18- Evaporation process is the reverse ofprocess, whileprocess is the reverse of deposition process.
- 19- Frost is formed as a result ofprocess, while fog is formed as a result ofprocess.
- 20- The point at which the temperature of a substance remains constant during its change from solid to liquid state is called the
- 21- The temperature at which a matter changes from the liquid state to the gaseous state at a certain temperature is called the
- 22- At normal atmospheric pressure, the melting point of ice is°C, while the boiling point of pure water is°C.
- 23- At the melting point, thebetween the particles of a substance weaken and the increase between them.
- 24- When the atmospheric pressure decreases, the boiling point of liquidswhile its melting point
- 25- The reduces the cooking time compared to regular pot, because it trapsinside.
- 26- The degree of the decrease in melting point of the solution depends on its
- 27-process occurs to the molecules on the surface of the liquid, whileprocess occurs to all molecules of the liquid.
- 28- Evaporation process takes a relativelyperiod of time, while boiling process takes a relativelyperiod of time.
- 29-changes of matter are not accompanied by the formation of new substance, whilechanges produce a new substance.
- 30- The speed of drying clothes can be increased by increasing..... and
- 31-coffee dissolves in water faster than regular coffee.
- 32- The greatest kinetic energy of matter particles is in the state, while the least kinetic energy is in thestate.

- 33- Systems are classified according to their ability to exchange andwith the surroundings int, closed system or
- 34- Matter exchange doesn't occur in both and
- 35- A pressure cooker issystem, while a thermos flask issystem.
- 36-represents the degree of hotness or coldness of the system.
- 37- Specific heat is a characteristic property of substances that differ according to theandof the substance.
- 38- The specific heat of oil isthan that of water.
- 39- Thermal energy is transferred from the system with the temperature to the system with thetemperature.
- 40- Heat is transferred in three different methods, which are,and
- 41- Heat transfers in iron by, while it transfers in water by.....
- 42- Cooking pot handles are made of thermalsuch asor, While the pots themselves are made of thermalsuch as
- 43- The phenomenon of sea breeze is based on heat transfer by
- 44- The heat of the Sun reaches us by, while the heat from the space heater reaches us byand
- 45-camera can detectradiation emitted from objects and convert it intoimages.

3) Write the scientific term:

- 1- Anything that has mass and occupies space.
- 2- One of the scientific theories that has succeeded in explaining much of the behavior and properties of matter.
- 3- The possibility of decreasing volume of matter by increasing the pressure exerted on them.
- 4- The ability of matter to flow easily.

- 5- The motion of the particles of matter from a region of high concentration to a region of low concentration.
- 6- The fourth state of matter, where gases are ionized and converted into positively charged ions and negatively charged free electrons.
- 7- The temperature at which water in all its parts starts to convert into water vapour.
- 8- A process that is accompanied by formation of air bubbles.
- 9- Any part of the universe that is under study, where changes in energy and matter are observed.
- 10- The summation of kinetic energy and potential energy for all particles of the system.
- 11- It is the quantity of heat required to raise the temperature of 1 kilogram of a substance by 1°C .
- 12- A system in which there is an exchange of matter and energy with the surrounding environment.
- 13- The system whose mass changes over time.
- 14- A liquid used in cooling due to its high specific heat value.
- 15- Energy transferred from one system to another due to the difference in their temperatures.
- 16- It is the measure for the extent to which a substance can conduct heat through it.
- 17- Invisible electromagnetic waves which have a thermal effect.

4) What is meant by (define):

1- Fluids.

➤

2- Melting point.

➤

3- Sublimation process.

➤

4- Normal atmospheric pressure.

➤

5- Isolated system.

➤

6- Temperature.

➤

7- The specific heat of a metal is 700 J/kg. °C.

➤

8- Thermal equilibrium:

➤

9- Sea breeze phenomenon.

➤

10- Electromagnetic waves.

➤

11- Thermal radiation:

➤

5) Put (√) or (x):

1- The mass of matter is a variable quantity that changes from one place to another. ()

2- Solids and liquids are called fluids. ()

3- The shape of a fluid changes depending on the shape of container that holds it. ()

4- The ability of fluids to flow increases with increasing viscosity. ()

5- The speed of diffusion of molecules with less mass is greater than that with greater mass. ()

6- Gas particles have kinetic energy, causes their movement in straight lines in all directions. ()

7- The speed of diffusion of H₂ gas differs from that of O₂ gas. ()

8- The interparticle spaces between particles increase as the attraction forces between them increase. ()

9- Particles of the same substance are identical, and their types differ from one substance to another. ()

10- The particles of a substance are in a state of continuous motion. ()

11- The interparticle spaces between the particles differ depending on the state of the matter. ()

- 12- Matter found in the Sun, stars and cosmic nebulae exist in the gas state. ()
- 13- Matter changed from one state to another when it gains thermal energy. ()
- 14- Water freezes in polar regions due to gaining thermal energy. ()
- 15- At melting point the temperature of a substance remains constant during its change from liquid to gas state. ()
- 16- Each pure substance has fixed melting point and boiling point at normal atmospheric pressure. ()
- 17- During the melting and boiling processes, the temperature of the substance remains constant. ()
- 18- When water boils, the forces of attraction between the particles increase and the interparticle spaces between them decrease. ()
- 19- The temperature decreases by 10 °C for every 300 m of altitude. ()
- 20- As we go up, atmospheric pressure decreases and boiling point of water becomes less than 100 °C. ()
- 21- The melting point of wax is equal to the melting point of table salt. ()
- 22- A decrease in the average speed of the particles of a matter leads to increase in their temperature. ()
- 23- The water cycle in nature directly affects many weather factors. ()
- 24- Energy exchange occurs in both closed and isolated systems. ()
- 25- Different substances have different specific heat values. ()
- 26- The amount of change in the temperature of an object increases as its mass increases when it gains an amount of heat. ()
- 27- The specific heat of copper is lower than that of aluminum. ()
- 28- The specific heat of a certain substance varies according to its physical state. ()
- 29- Heat transfers from the colder object to the hotter object. ()
- 30- Thermal equilibrium occurs when there is a difference in the quantity of heat. ()

- 31- The thermal conductivity of solid clay bricks is better than that of hollow clay bricks. ()
- 32- Copper has greater thermal conductivity than silver. ()
- 33- When air cools, its density increases and it moves downwards. ()
- 34- The idea of wearing dark clothes in winter is based on heat transfer by conduction. ()
- 35- Dark clothes can absorb infrared radiation better than light-colored clothes. ()
- 36- Heat transfer by radiation occurs through material and non-material media. ()

6) Correct the underlined words:

- 1- The matter is compressed in the gas state to reduce its mass.
- 2- Gas molecules vibrate around their fixed position.
- 3- Pure water boils at 0 °C in normal atmospheric pressure.
- 4- Dry ice is nitrogen in its solid state.
- 5- Biology is the science of studying water.
- 6- The rate of evaporation increases by decreasing the temperature.
- 7- In isolated system there is an exchange of energy without matter with the surrounding environment.
- 8- The thermos flask represents a closed system.
- 9- Matter exchange occurs only in isolated system.
- 10- The change in temperature is calculated by barometer.
- 11- Cans of soft drinks represent isolated systems.
- 12- Mercury is an excellent cooling liquid.
- 13- The specific heat of ice is equal to that of water.
- 14- Heat is one of the forms of matter.
- 15- The cooling systems of electronic devices depend on heat transfer by convection.
- 16- Copper is the first element according to thermal conductivity among natural elements.
- 17- Cold water has density equal to that of hot water.
- 18- Heat transfers from the sun to the earth by convection.
- 19- Infrared rays have a chemical effect.

7) Cross out the odd word and write the scientific term of others:

1- Oil / Alcohol / Water/ Oxygen.

➤ Scientific term:

2- Able to flow/ Compressible / Has indefinite volume / Has a fixed shape.

➤ Scientific term:

3- Melting / Boiling / Freezing / Evaporation.

➤ Scientific term:

4- Condensation / Freezing / Deposition / Sublimation.

➤ Scientific term:

5- Conduction / Evaporation / Convection / Radiation.

➤ Scientific term:

8) Mention the difference between (compare):

1- Solid matter, liquid matter and gaseous matter, in terms of (Fluidity – Compressibility – Diffusibility).

2- Ice, water and water vapour, in terms of (Particles movement – Interparticle spaces - Attraction forces).

3- Evaporation and boiling processes in terms of (temperature – place of occurrence - formation of air bubbles)

4- Thermal conduction and Thermal convection in term of definition.

5- Thermal conductors and thermal insulators.

9) Give reason for:

1- Solids have a definite shape and volume.

➤

2- It is difficult to break a piece of rock.

➤

3- Liquids and gases are called fluids.

➤

4- Honey flows slower than water.

➤

5- Gases are characterized by the compressibility.

(Gaseous substances don't have a fixed shape or definite volume.)

➤

6- When you leave the perfume bottle open, its odor will spread very fast in air all over the room.

➤

7- Water gradually turns purple when a potassium permanganate crystal is added.

➤

8- Particles of matter spread faster in gases than in liquids.

➤

9- It is easy to divide a quantity of water into small portions.

➤

10- Table salt can dissolve in water.

➤

11- Gases have a great diffusibility.

➤

12- Gases are passed through a high electric field in some air conditioners.

➤

13- The matter changes from solid state to liquid state by heating.

➤

14- The conversion of matter from the liquid state to the solid state by cooling.

➤

15- During the melting and boiling processes, the temperature of the substance remains constant.

➤

**16- The purity of a substances is verified by comparing its melting point or boiling point with their fixed values in its pure state.
(The boiling point of glucose sugar solution is higher than that of distilled water)**

➤

17- At the top of mountains, the boiling point of water becomes lower than 100°C.

➤

18- Cooking in the steam pot saves fuel.

➤

19- Water evaporates faster from the pot when the stove temperature is raised.

➤

20- The rate of evaporation increases when the surface area of the liquid exposed to air increases.

➤

21- Wet clothes dry faster in summer than in winter.

➤

22- Feeling uncomfortable in hot, humid weather.

➤

23- A cup of hot tea represents an open system.

➤

24- The change in temperature of the substance increases as its mass decreases.

➤

25- Water makes up a large proportion of the human body.

➤

26- Water is used to cool many systems.

➤

27- Mercury is used in thermometers.

➤

28- Copper is thermally preferable materials for making heating utensils instead of aluminum.

➤

29- Heat transfers from a hot body to a cold body.

➤

30- When a quantity of iron balls at 80°C is mixed with a quantity of water at 30°C , the temperature of the mixture at equilibrium is not 55°C .

➤

31- Polystyrene panels are placed between bricks during building walls.

➤

32- Cooking utensils are made of metal while their handles are made of wood or plastic.

➤

33- Silver is used in the cooling systems of smartphones.

➤

34- The freezer is installed at the top of the refrigerator.

➤

35- Heater is placed on the floor of a room.

➤

36- An eagle soars at high altitudes without flapping its wings.

➤

37- The occurrence of the sea breeze phenomenon.

➤

38- Heat transfers from the sun to the earth despite the great distance between them.

➤

39- Firefighters wear shiny silver suits.

➤

40- The pipes of the solar heaters are painted black.

➤

41- Snakes are able to hunt their prey at night.

➤

10) What are the results of (What happens...)?

- 1- The piston of a closed syringe containing fine sand is pressed.
➤
- 2- Table salt is added in water with stirring.
➤
- 3- Opening a bottle of ammonia in a room.
➤
- 4- The liquid substance gains thermal energy.
➤
- 5- Loss of thermal energy of water vapour molecules in air.
➤
- 6- The temperature of water vapor decreases below 0°C .
➤
- 7- Leaving dry ice in open place.
➤
- 8- Heating solid iodine.
➤
- 9- The humidity increases. (according to the rate of evaporation)
➤
- 10- The atmospheric pressure increases higher than the normal pressure.
(according to melting and boiling points of water)
➤
- 11- The atmospheric pressure affecting pure water decreases below normal atmospheric pressure.
➤
- 12- Exposing sprayed concentrated coffee extract to extremely hot dry air.
➤
- 13- Heating two different masses of distilled water separately at the same temperature for an equal period of time using a steady flame.
➤

14- Heating two equal masses of water and oil separately at the same temperature for an equal period of time using a steady flame.

➤

15- Two objects with the same temperature come into contact.

➤

16- A metal spoon is placed in a cup of hot tea.

➤

11) State one importance for each of the following:

1- Steam pot:

2- Radiator:

3- Thermography:

12) Study the following figures then answer:

1- The opposite figure represents heating curve of water:

a) Which part of the graph refers to the existence of the substance in liquid state only?

➤

b) Which part of the graph refers to the existence of the substance in both liquid and gas states?

➤

c) Which part of the graph refers to melting process?

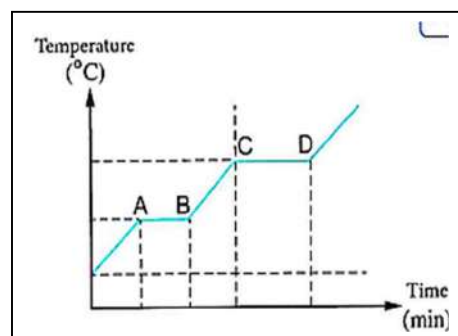
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d) Which point(s) represents the boiling point?

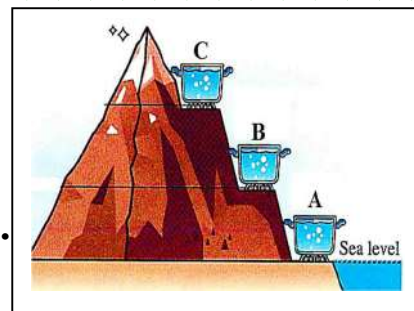
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e) In which part(s) of the graph, does the temperature of the substance remain constant?

➤



2- Study the opposite figure, then complete:



- a) The lowest boiling point of water is at the point
- b) At point, the boiling point of water is 100°C .
- c) The atmospheric pressure at point (B) is higher than that at pointand lower than that at point
- d) The atmospheric pressure at pointis called normal atmospheric pressure.
- e) The correct descending order of boiling point of water at these points is..... > >
- f) What is the boiling point of water at the point (C), if its altitude is 4800m?

➤

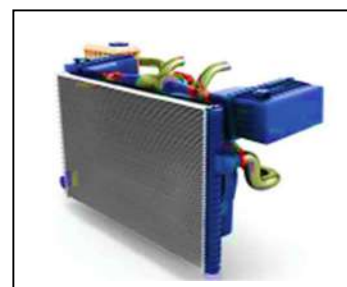
3- Study the opposite table, then complete:

Substance	X	Y	Z
Specific heat (j/Kg. $^{\circ}\text{C}$)	450	900	2000

- a) The substance that requires the least amount of heat per kilogram to raise its temperature by 1°C is
- b) The material that needs the longest time to gain the same amount of heat until its temperature rises by 1°C is
- c) What happens when two equal masses of substances (X) and (Y) are heated over a steady flame for 5 minutes? And why?

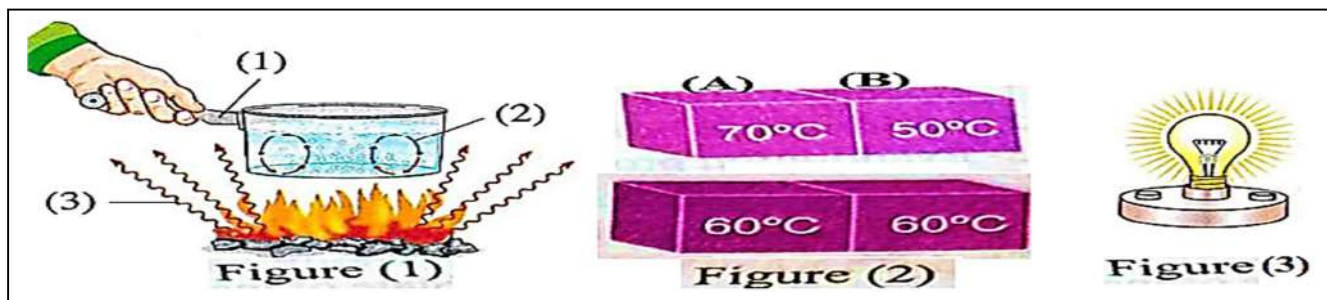
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4- Study the opposite figure, then complete:



- a) The figure showsthat is cooling system connected to
- b) The liquid used in the figure is, because it has.....

5- Study the opposite figure, then complete:



- a) In figure (1), methods of heat transfer are:
 1- 2 – 3 –
- b) In figure (2), heat transfers between the two copper cubes from cube..... to cubeby
- c) In figure (2), heat transfer stops between the two copper cubes because they reach a state called, where temperatures of the two cubes become
- d) In figure (3), heat transfers byand
- *****

13) Variant questions:

1- Mention: four assumptions about the particle theory of matter.

-

2- Identify the factors affecting each of the following:

- a) State of matter:
- b) The speed of diffusion:
- c) Melting and boiling points:
- d) The rate of liquid evaporation:
- e) Change in the temperature of objects:
- f) The temperature of a body (system):

3- Mention a technological (or life) application that based on:

- a) Effect of pressure on boiling point:
- b) Effect of the surface area on evaporation rate:
- c) Water as an excellent cooling liquid:
- d) Heat transfer by conduction:
- e) Heat transfer by convection:
- f) Heat transfer by radiation:

4- An empty closed container its volume is 200 cm^3 , if 50 cm^3 of air is removed from it. What is the volume of air remaining in the container? Explain why.

-
-

5- If you know that the specific heat of 1 kg of iron is $450 \text{ J/kg}^\circ\text{C}$. What is the specific heat of 10 kg of iron? With explanation.

-
-

6- Arrange each group according to what is required in the brackets:

- a) Wood – Oxygen – Oil.
(In ascending order according to the attraction forces between particles)

➤

- b) Spong – Air – Water.
(In ascending order according to diffusibility)

➤

- c) Copper - Diamond- Silver.
(In descending order according to their thermal conductivity)

➤

Prep 2 Final Revision on unit 1 (answered)

1) Choose the correct answer:

- 1- Compression of matter means that it.....
 - a) changes from one state to another
 - b) changes its mass
 - c) changes the size of its particles
 - d) reduces its volume
- 2-has a definite shape.
 - a) Air
 - b) Oil
 - c) Ice
 - d) Water
- 3- Air and water are similar in that they both.....
 - a) have mass
 - b) can be seen
 - c) have a fixed shape
 - d) have a fixed volume
- 4-can flow.
 - a) wood and iron
 - b) water and oxygen
 - c) glass and water
 - d) oil and wood
- 5- Air is characterized by it has
 - a) no mass
 - b) a definite shape
 - c) a definite volume
 - d) no definite shape
- 6- Diffusion in occurs with an average speed.
 - a) wood
 - b) iron
 - c) water
 - d) air
- 7- The common property of glass and water is that both.....
 - a) have fixed volume
 - b) have fixed shape
 - c) can flow
 - d) can be compressed
- 8- are considered fluids.
 - a) Ice and liquid water.
 - b) Oil and iron.
 - c) Water vapor and liquid water.
 - d) Iron and water vapor.
- 9- Iron is characterized by having.....
 - a) no fixed volume or shape
 - b) a fixed shape and no fixed volume
 - c) a fixed shape and volume
 - d) a fixed volume and no fixed shape
- 10- As viscosity of liquids increases, the ability of liquids to flow.....
 - a) increases
 - b) doubled
 - c) decreases
 - d) doesn't change
- 11- Thestate is used in air conditioners to improve air quality in enclosed spaces.
 - a) solid
 - b) liquid
 - c) gas
 - d) plasma

- 12- Change in.....refers to transfer energy from or to the system.
 a) mass b) state c) pressure d) temperature
- 13- The speed of the matter particles increases during.....processes.
 a) Melting and freezing b) Freezing and boiling
 c) Evaporation and condensation d) Melting and evaporation
- 14- If the freezing and boiling points of substance (X) are 110 °C and 190°C respectively, so the state of this substances at 80°C is.....
 a) solid b) liquid c) gas d) plasma
- 15- When a solid substance melts, its particles.....
 a) keep vibrating around their positions.
 b) stop vibrating.
 c) move more freely and randomly in all directions.
 d) are released from their fixed positions.
- 16- The boiling point of water at the top of a mountain its height equals 1800 m is.....
 a) 100 b) 94 c) 90 d) 80
- 17- The kinetic energy of matter particles decreases during..... andprocesses.
 a) condensation and freezing b) freezing and boiling
 c) Evaporation and melting d) freezing and evaporation
- 18- andprocesses are accompanied by gaining thermal energy.
 a) Melting and freezing b) Freezing and boiling
 c) Evaporation and condensation d) Melting and evaporation
- 19-is the temperature at which all liquid particles overcome the attractive forces between them and converts to the gaseous state.
 a) melting point b) freezing point
 c) boiling point d) no correct answer
- 20- Water molecules have the lowest kinetic energy when it is in the form of.....
 a) ice b) water drops c) water vapor d) steam

- 21- Melting process is the reverse process of.....
- a) boiling b) freezing c) evaporation d) condensation
- 22- Objects with more thermal energy have.....kinetic energy.
- a) more b) less c) the same d) no
- 23- The change of matter from the gaseous state to the solid state directly without passing through the liquid state is called.....process.
- a) evaporation b) freezing c) condensation d) deposition
- 24- When boiling a certain volume of water, a larger volume of vapor is produced, because.....
- a) The vapor particles are farther away compared to that of water.
b) The structure of water differs from that of vapor.
c) Water particles collide upon boiling.
d) water boiling increases the number of particles.
- 25- The formation of frost represents.....process.
- a) evaporation b) freezing c) condensation d) deposition
- 26- All the followings express water transformations except.....
- a) physical processes. b) chemical processes.
c) reversible processes. d) accompanied by thermal changes.
- 27- The same change in physical state occurs in the processes of.....
- a) Melting and freezing b) Freezing and boiling
c) Evaporation and boiling d) Melting and evaporation
- 28- The boiling point of water at the highest peak of mountain whose altitude is 3000 m is.....°C.
- a) 100 b) 94 c) 90 d) 80
- 29- When table salt is dissolved in distilled water.....
- a) the melting point increases. b) the boiling point increases.
c) the boiling point decreases. d) the melting point doesn't change.
- 30- The rate of liquid evaporation increases by increasing all of the followings except.....
- a) temperature. b) surface area.
c) humidity. d) speed of air currents.

- 31- When the internal energy of the system increases,.....
- a) the temperature decreases. b) the temperature increases.
 c) the temperature remains the same. d) The particles stop moving.
- 32- When a substance is heated, its particles.....
- a) average kinetic energy decreases. b) potential energy increases.
 c) average kinetic energy increases. d) internal energy decreases.
- 33- When two identical copper cubes come into contact, the temperature of the first cube is 60°C and the second is 40°C , their temperatures will be $^{\circ}\text{C}$ at the thermal equilibrium.
- a) 30 b) 50 c) 70 d) 100
- 34- When stirring a cup of hot tea using a metal spoon, heat transfers to the hand by.....
- a) conduction. b) convection. c) radiation. d) b & c.
- 35- All the following are good heat conductors, except.....
- a) iron. b) copper. c) aluminum. d) wood.
- 36- We can distinguish easily between the thermal conductivity of.....
- a) iron and copper. b) copper and aluminum.
 c) wood and plastic. d) iron and plastic.
- 37- During ironing clothes with an electric iron, heat transfers from the base of the iron to the clothes by.....
- a) conduction. b) convection. c) radiation. d) b & c.
- 38- Heat transfers by convection in all the following, except
- a) chlorine. b) water. c) air. d) aluminum.
- 39- When air heats up, its density.....
- a) decreases and it goes down. b) decreases and it rises up.
 c) increases and it goes down. d) increases and it rises up.
- 40- The effect of sea breeze is more perceptible in.....
- a) summer. b) spring. c) winter. d) autumn.
- 41- Houses in hot countries are painted with white colour because white surfaces.....
- a) reflect radiation. b) transfer radiation.
 c) let radiation pass through them. d) absorb radiation.

2) Complete the following statements:

- 1- Gas materials can flow and can be compressed, while liquid materials can flow and can't be compressed.
- 2- Diffusion through gas materials is very fast, while diffusion through solid materials is very slow.
- 3- The speed of diffusion increases by increasing the temperature of the diffusion medium.
- 4- Fluids are substances that are in liquid or gas states.
- 5- When flow occurs, the volume of the liquid materials doesn't change, while the volume of the gas materials change.
- 6- The particles of a substance have kinetic energy due to their continuous motion, while they have potential energy due to forces of attraction between them.
- 7- The flow of liquids varies according to their viscosity.
- 8- The speed of diffusion through solids is less than the speed of diffusion through liquids.
- 9- The interparticle spaces between iron particles are very small, while they are very large between hydrogen particles.
- 10- The attractive forces between particles are greatest in the solid materials, while almost not exist in gas materials.
- 11- The scientist Brown discovered the random movement of particles suspended in fluids, which is known as Brownian motion.
- 12- Brownian motion occurs as a result of collisions between relatively large particles and fluid particles.
- 13- There is a fourth state of matter known as plasma, and it is found in outer space such as matter found in the Sun, stars and cosmic nebulae.
- 14- Plasma is used in air conditioners to purify air by breaking down harmful pollutants, germs and viruses.
- 15- When matter gains thermal energy, so the kinetic energy of its particles increases, leads to an increase in its temperature.
- 16- At melting point, matter exists in both solid and liquid states at the same temperature.

- 17- Freezing and condensation processes are accompanied by losing thermal energy.
- 18- Evaporation process is the reverse of condensation process, while sublimation process is the reverse of deposition process.
- 19- Frost is formed as a result of deposition process, while fog is formed as a result of condensation process.
- 20- The point at which the temperature of a substance remains constant during its change from solid to liquid state is called the melting point.
- 21- The temperature at which a matter changes from the liquid state to the gaseous state at a certain temperature is called the boiling point.
- 22- At normal atmospheric pressure, the melting point of ice is 0 °C, while the boiling point of pure water is 100 °C.
- 23- At the melting point, the attractive forces between the particles of a substance weaken and the interparticle spaces increase between them.
- 24- When the atmospheric pressure decreases, the boiling point of liquids decreases while its melting point increases.
- 25- The pressure cooker (or steam pot) reduces the cooking time compared to regular pot, because it traps steam inside.
- 26- The degree of the decrease in melting point of the solution depends on its concentration.
- 27- Evaporation process occurs to the molecules on the surface of the liquid, while boiling process occurs to all molecules of the liquid.
- 28- Evaporation process takes a relatively long period of time, while boiling process takes a relatively short period of time.
- 29- Physical changes of matter are not accompanied by the formation of new substance, while chemical changes produce a new substance.
- 30- The speed of drying clothes can be increased by increasing temperature and speed of air currents.
- 31- Instant coffee dissolves in water faster than regular coffee.
- 32- The greatest kinetic energy of matter particles is in the gas state, while the least kinetic energy is in the solid state.

- 33- Systems are classified according to their ability to exchange energy and matter with the surroundings into open system, closed system or isolated system.
- 34- Matter exchange doesn't occur in both closed system and isolated system.
- 35- A pressure cooker is a closed system, while a thermos flask is an isolated system.
- 36- Temperature represents the degree of hotness or coldness of the system.
- 37- Specific heat is a characteristic property of substances that differ according to the type and physical state of the substance.
- 38- The specific heat of oil is lower than that of water.
- 39- Thermal energy is transferred from the system with the higher temperature to the system with the lower temperature.
- 40- Heat is transferred in three different methods, which are conduction, convection and radiation.
- 41- Heat transfers in iron by conduction, while it transfers in water by convection.
- 42- Cooking pot handles are made of thermal insulators such as wood or plastic, While the pots themselves are made of thermal conductors such as metals (aluminum).
- 43- The phenomenon of sea breeze is based on heat transfer by convection.
- 44- The heat of the Sun reaches us by radiation, while the heat from the space heater reaches us by convection and radiation.
- 45- Thermographic camera can detect thermal radiation emitted from objects and convert it into coloured images.

3) Write the scientific term:

- 1- Anything that has mass and occupies space. (Matter)
- 2- One of the scientific theories that has succeeded in explaining much of the behavior and properties of matter. (Particle theory of matter)
- 3- The possibility of decreasing volume of matter by increasing the pressure exerted on them. (Compressibility)
- 4- The ability of matter to flow easily. (Fluidity)

- 5- The motion of the particles of matter from a region of high concentration to a region of low concentration. (Diffusibility)
- 6- The fourth state of matter, where gases are ionized and converted into positively charged ions and negatively charged free electrons. (Plasma)
- 7- The temperature at which water in all its parts starts to convert into water vapour. (Boiling point)
- 8- A process that is accompanied by formation of air bubbles. (Boiling process)
- 9- Any part of the universe that is under study, where changes in energy and matter are observed. (System)
- 10- The summation of kinetic energy and potential energy for all particles of the system. (Internal energy)
- 11- It is the quantity of heat required to raise the temperature of 1 kilogram of a substance by 1°C. (Specific heat)
- 12- A system in which there is an exchange of matter and energy with the surrounding environment. (Open system)
- 13- The system whose mass changes over time. (Open system)
- 14- A liquid used in cooling due to its high specific heat value. (Water)
- 15- Energy transferred from one system to another due to the difference in their temperatures. (Heat)
- 16- It is the measure for the extent to which a substance can conduct heat through it. (Thermal conductivity)
- 17- Invisible electromagnetic waves which have a thermal effect. (Infrared rays)

4) What is meant by (define):

1- Fluids.

- Matters that have the ability to flow and take the shape of their container.

2- Melting point.

- The temperature at which a matter changes from the solid state to the liquid state.

3- Sublimation process.

- The change of matter from the solid state to the gaseous state directly without passing through the liquid state.

4- Normal atmospheric pressure.

- The atmospheric pressure at the sea level.

5- Isolated system.

- System in which there is no exchange of matter and energy with the surrounding environment.

6- Temperature.

- A measure of the average kinetic energy of the system's particles.

7- The specific heat of a metal is 700 J/kg. °C.

- It means that the quantity of heat required to raise the temperature of 1 kilogram of this metal by 1°C equals 700 joule.

8- Thermal equilibrium:

- It is the state reached by two systems with different temperatures after they come into contact and their temperatures become equal.

9- Sea breeze phenomenon.

- A natural phenomenon in which cool air (breeze) blowing from the sea towards the land during the daytime.

10- Electromagnetic waves.

- They are waves that propagate through space at very high speeds reaching 300,000 km/s in all directions.

11- Thermal radiation:

- It is the transfer of infrared radiation from the surfaces of objects, especially the hot objects, without the need for material particles.

5) Put (✓) or (x):

- 1- The mass of matter is a variable quantity that changes from one place to another. (X)
- 2- Solids and liquids are called fluids. (X)
- 3- The shape of a fluid changes depending on the shape of container that holds it. (✓)
- 4- The ability of fluids to flow increases with increasing viscosity. (X)
- 5- The speed of diffusion of molecules with less mass is greater than that with greater mass. (✓)
- 6- Gas particles have kinetic energy, causes their movement in straight lines in all directions. (✓)

- 7- The speed of diffusion of H_2 gas differs from that of O_2 gas. (✓)
- 8- The interparticle spaces between particles increase as the attraction forces between them increase. (X)
- 9- Particles of the same substance are identical, and their types differ from one substance to another. (✓)
- 10- The particles of a substance are in a state of continuous motion. (✓)
- 11- The interparticle spaces between the particles differ depending on the state of the matter. (✓)
- 12- Matter found in the Sun, stars and cosmic nebulae exist in the gas state. (X)
- 13- Matter changed from one state to another when it gains thermal energy. (✓)
- 14- Water freezes in polar regions due to gaining thermal energy. (X)
- 15- At melting point the temperature of a substance remains constant during its change from liquid to gas state. (X)
- 16- Each pure substance has fixed melting point and boiling point at normal atmospheric pressure. (✓)
- 17- During the melting and boiling processes, the temperature of the substance remains constant. (✓)
- 18- When water boils, the forces of attraction between the particles increase and the interparticle spaces between them decrease. (X)
- 19- The temperature decreases by $10^\circ C$ for every 300 m of altitude. (X)
- 20- As we go up, atmospheric pressure decreases and boiling point of water becomes less than $100^\circ C$. (✓)
- 21- The melting point of wax is equal to the melting point of table salt. (X)
- 22- A decrease in the average speed of the particles of a matter leads to increase in their temperature. (X)
- 23- The water cycle in nature directly affects many weather factors. (✓)
- 24- Energy exchange occurs in both closed and isolated systems. (X)
- 25- Different substances have different specific heat values. (✓)
- 26- The amount of change in the temperature of an object increases as its mass increases when it gains an amount of heat. (X)
- 27- The specific heat of copper is lower than that of aluminum. (✓)
- 28- The specific heat of a certain substance varies according to its physical state. (✓)
- 29- Heat transfers from the colder object to the hotter object. (X)

- 30- Thermal equilibrium occurs when there is a difference in the quantity of heat. (X)
- 31- The thermal conductivity of solid clay bricks is better than that of hollow clay bricks. (✓)
- 32- Copper has greater thermal conductivity than silver. (X)
- 33- When air cools, its density increases and it moves downwards. (✓)
- 34- The idea of wearing dark clothes in winter is based on heat transfer by conduction. (X)
- 35- Dark clothes can absorb infrared radiation better than light-colored clothes. (✓)
- 36- Heat transfer by radiation occurs through material and non-material media. (✓)

6) Correct the underlined words:

- 1- The matter is compressed in the gas state to reduce its mass. (volume)
- 2- Gas molecules vibrate around their fixed position. (Solid)
- 3- Pure water boils at 0 °C in normal atmospheric pressure. (100 °C)
- 4- Dry ice is nitrogen in its solid state. (CO₂)
- 5- Biology is the science of studying water. (Hydrology)
- 6- The rate of evaporation increases by decreasing the temperature. (humidity)
- 7- In isolated system there is an exchange of energy without matter with the surrounding environment. (closed)
- 8- The thermos flask represents a closed system. (an isolated)
- 9- Matter exchange occurs only in isolated system. (Open)
- 10- The change in temperature is calculated by barometer. (thermometer)
- 11- Cans of soft drinks represent isolated systems. (closed)
- 12- Mercury is an excellent cooling liquid. (Water)
- 13- The specific heat of ice is equal to that of water. (lower than)
- 14- Heat is one of the forms of matter. (energy)
- 15- The cooling systems of electronic devices depend on heat transfer by convection. (conduction)
- 16- Copper is the first element according to thermal conductivity among natural elements. (Diamond)
- 17- Cold water has density equal to that of hot water. (higher than)
- 18- Heat transfers from the sun to the earth by convection. (radiation)
- 19- Infrared rays have a chemical effect. (thermal)

7) Cross out the odd word and write the scientific term of others:

1- Oil / Alcohol / Water/ Oxygen.

➤ Scientific term: **liquid matters**.

2- Able to flow/ Compressible / Has indefinite volume / Has a fixed shape.

➤ Scientific term: **Properties of gases**.

3- Melting / Boiling / Freezing / Evaporation.

➤ Scientific term: **processes occur by gaining heat**.

4- Condensation / Freezing / Deposition / Sublimation.

➤ Scientific term: **processes occur by losing heat**.

5- Conduction / Evaporation / Convection / Radiation.

➤ Scientific term: **ways of heat transfer**.

8) Mention the difference between (compare):

1- Solid matter, liquid matter and gaseous matter, in terms of (Fluidity – Compressibility – Diffusibility).

P.O.C.	Solids	Liquids	Gases
Fluidity	Don't have the ability to flow.	Have the ability to flow.	Have the ability to flow.
Compressibility	Incompressible	Incompressible	Compressible
Diffusibility	Very slow.	Average.	Very fast.

2- Ice, water and water vapour, in terms of (Particles movement – Intermolecular spaces - Attraction forces).

P.O.C.	Ice	Water	Water vapour
Particles Movement	Vibrate in their fixed position.	Move more freely.	Randomly and completely freely.
Interparticle spaces	Very small.	Relatively large.	Very large.
Attraction forces	Very strong.	Relatively weak..	Very weak.

3- Evaporation and boiling processes in terms of (temperature – place of occurrence - formation of air bubbles).

P.O.C.	Evaporation process	Boiling process
Temperature	At any temperature less than boiling point.	At a certain temperature (the boiling point).
Place of occurrence	Occur to the molecules on the surface of the liquid.	Occur to all molecules of the liquid.
Air bubbles	Doesn't accompanied by formation of air bubbles.	Accompanied by formation of air bubbles.

4- Thermal conduction and Thermal convection in term of definition.

Thermal conduction	Thermal convection
The transfer of thermal energy through solid objects without movement of particles from their positions.	The transfer of thermal energy through fluids (liquid and gases) with the movement of their particles.

5- Thermal conductors and thermal insulators.

Thermal conductors	Thermal insulators
Good heat-conducting substances.	Poor heat-conducting substances.
Have high thermal conductivity.	Have low thermal conductivity.
Ex. Diamonds and all Metals.	Ex. Wood, and plastic.

9) Give reason for:

1- Solids have a definite shape and volume.

- Because the forces of attraction between solid particles are very strong and the interparticle spaces are very small.

2- It is difficult to break a piece of rock.

- Because it has very strong forces of attraction between its particles, so they are tightly bound together.

3- Liquids and gases are called fluids.

- Because they have the ability to flow and take the shape of their container.

4- Honey flows slower than water.

- Because honey has a higher viscosity than water.

5- Gases are characterized by the compressibility.

(Gaseous substances don't have a fixed shape or definite volume.)

- Because the forces of attraction between gas particles are very weak and the interparticle spaces are very large.

6- When you leave the perfume bottle open, its odor will spread very fast in air all over the room.

- Because the forces of attraction between air particles are very weak and the interparticle spaces are very large so perfume particles can spread into these spaces.

7- Water gradually turns purple when a potassium permanganate crystal is added.

- Because the interparticle spaces between liquid particles are relatively greater so particles of potassium permanganate can diffuse in these spaces with an average speed from a region of high concentration to a region of low concentration.

8- Particles of matter spread faster in gases than in liquids.

- Because the interparticle spaces between gas particles are greater than that of liquid.

9- It is easy to divide a quantity of water into small portions.

- Because the forces of attraction between liquid particles are relatively weak, which allows them to move more freely.

10- Table salt can dissolve in water.

- Because the interparticle spaces between water particles are relatively greater, so the particles of table salt spread in the intermolecular spaces among water.

11- Gases have a great diffusibility.

- Because the forces of attraction between gas particles are very weak, which allows them to move randomly and completely freely.

12- Gases are passed through a high electric field in some air conditioners.

- To convert their atoms into negatively charged electrons and positively charged ions that break down harmful air pollutants, germs, and viruses, making the air more pure.

13- The matter changes from solid state to liquid state by heating.

- Because when solid matter gains thermal energy, the kinetic energy of its particles increases and its temperature gradually rises till it reaches the melting point and changed to liquid.

14- The conversion of matter from the liquid state to the solid state by cooling.

- Because when liquid matter loses thermal energy, the kinetic energy of its particles decreases and its temperature gradually decreases till it reaches the freezing point and changed to solid.

15- During the melting and boiling processes, the temperature of the substance remains constant.

- Because the thermal energy which is gained by the substance is used to weaken the attractive forces between the particles of the substance.

16- The purity of a substances is verified by comparing its melting point or boiling point with their fixed values in its pure state.

(The boiling point of glucose sugar solution is higher than that of distilled water)

- Because impurities affect the attraction forces between the particles of a pure substance, which results in changing the amount of energy required to change its state, and thus changes both the melting point and boiling point of this substance.

17- At the top of mountains, the boiling point of water becomes lower than 100°C.

- Because by increasing the altitude above sea level, the atmospheric pressure decreases and the temperature decreases by 1°C for every 300 m of altitude, as a result the boiling point of water decreases.

18- Cooking in the steam pot saves fuel.

- Because it traps steam inside it during cooking, which increases the pressure inside it and increases the boiling point, thus reducing the cooking time.

19- Water evaporates faster from the pot when the stove temperature is raised.

- Because raising the temperature increases the number of molecules that have sufficient thermal energy to escape from the surface of the liquid.

20- The rate of evaporation increases when the surface area of the liquid exposed to air increases.

- Because the number of molecules that can gain heat energy from the surrounding medium increases and thus be released from the surface of the liquid.

21- Wet clothes dry faster in summer than in winter.

- Because high temperature during the day in summer increases the number of molecules that have sufficient energy to escape from the surface thus increasing the rate of evaporation.

22- Feeling uncomfortable in hot, humid weather.

- Because hot weather increases the sweat secretion to cool the body, but high humidity decreases the rate of sweat evaporation.

23- A cup of hot tea represents an open system.

- Because energy and matter are exchanged with the surroundings.

24- The change in temperature of the substance increases as its mass decreases.

- Because the thermal energy gained by substance is distributed over fewer particles, so the average kinetic energy increases.

25- Water makes up a large proportion of the human body.

- Because it has high specific heat, so it keeps the body temperature constant when the temperature of surroundings changed.

26- Water is used to cool many systems.

- Due to its high specific heat, as it absorbs large quantities of heat energy without a significant increase in its temperature.

27- Mercury is used in thermometers.

- Because mercury has low specific heat, so its temperature rises quickly upon gaining any quantity of heat.

28- Copper is thermally preferable materials for making heating utensils instead of aluminum.

- Because copper has lower specific heat than that of aluminum.

29- Heat transfers from a hot body to a cold body.

- Due to difference in their temperature where heat is transferred from the system with the higher temperature (hot body) to the system with the lower temperature (cold body).

30- When a quantity of iron balls at 80°C is mixed with a quantity of water at 30°C , the temperature of the mixture at equilibrium is not 55°C .

- Because they are different in type and therefore in specific heat.

31- Polystyrene panels are placed between bricks during building walls.

- Because polystyrene is a thermal insulator substance that helps to avoid rapid temperature changes inside buildings that reduces air conditioning costs within the buildings.

32- Cooking utensils are made of metal while their handles are made of wood or plastic.

- Because aluminum is a thermal conductor, while wood is a thermal insulator.

33- Silver is used in the cooling systems of smartphones.

- To get rid of generated heat within the internal components, which may reduce performance and may damage them.

34- The freezer is installed at the top of the refrigerator.

- To ensure cold air distribution throughout the refrigerator where the denser cold air sinks to the bottom and allowing the lighter warm air to rise to the top.

35- Heater is placed on the floor of a room.

- To ensure the distribution of heat throughout the room where heat is transferred from the space heater to the surrounding air, causing the warmer, less dense air to rise to the top while the cooler, denser air moves downwards.

36- An eagle soars at high altitudes without flapping its wings.

- Because the force exerted by rising warm air convection currents equals the gravitational force, thus keeping the eagle floating in the air.

37- The occurrence of the sea breeze phenomenon.

- Due to the fact that land heats up more quickly than water during the day, as land has lower specific heat than that of sea water.

38- Heat transfers from the sun to the earth despite the great distance between them.

- Because heat transfers by radiation that doesn't require the presence of material particles.

39- Firefighters wear shiny silver suits.

- Because shiny objects reflect infrared rays well.

40- The pipes of the solar heaters are painted black.

- To increase its absorption of infrared radiation so the temperature of the water within it rises.

41- Snakes are able to hunt their prey at night.

- Because they have sensory receptors at the front of their heads, which enable them to detect infrared rays emitted by their preys bodies.

10) What are the results of (What happens...)?

1- The piston of a closed syringe containing fine sand is pressed.

- The volume of the sand remains unchanged and can't be compressed.

2- Table salt is added in water with stirring.

- The particles of table salt spread in the intermolecular spaces among water and dissolve in water.

3- Opening a bottle of ammonia in a room.

- The odor of ammonia will spread very fast in air all over the room.

4- The liquid substance gains thermal energy.

- The kinetic energy of its particles increases, so its temperature increases and the attraction forces between the particles decreases, and at the boiling point it converts into gaseous state.

5- Loss of thermal energy of water vapour molecules in air.

- This leads to its condensation in the form of fog, dew or clouds.

6- The temperature of water vapor decreases below 0°C.

- The formation of frost due to deposition process.

7- Leaving dry ice in open place.

- It gains thermal energy from the surrounding medium and sublimates into gas state (CO₂ gas).

8- Heating solid iodine.

- It gains thermal energy and sublimates into iodine vapour (gas state).

9- The humidity increases. (according to the rate of evaporation)

- The rate of evaporation decreases.

10- The atmospheric pressure increases higher than the normal pressure. (according to melting and boiling points of water)

- The boiling point becomes higher than 100°C and its freezing point becomes lower than 0°C.

11- The atmospheric pressure affecting pure water decreases below normal atmospheric pressure.

- The boiling point of water becomes lower than 100°C, while freezing point becomes more than 0°C.

12- Exposing sprayed concentrated coffee extract to extremely hot dry air.

- The surface area of the spray droplets increases, so the rate of evaporation increases and solid instant coffee crystals are formed.

13- Heating two different masses of distilled water separately at the same temperature for an equal period of time using a steady flame.

- The temperature of the smaller mass rises by a greater extent than that of larger mass.

14- Heating two equal masses of water and oil separately at the same temperature for an equal period of time using a steady flame.

- The temperature of oil rises by a greater extent than that of water as the specific heat of oil is lower than that of water.

15- Two objects with the same temperature come into contact.

- No heat transfer occurs.

16- A metal spoon is placed in a cup of hot tea.

- Heat transfers from the hot tea to the metal spoon by conduction.

11) State one importance for each of the following:

- 1- Steam pot:** traps steam inside it during cooking to reduce the cooking time and save fuel.
- 2- Radiator:** cooling system connected to car engines to protect them from damage
- 3- Thermography:** technique that uses a camera to detect thermal radiation emitted from objects and convert it into coloured images.

12) Study the following figures then answer:

1- The opposite figure represents heating curve of water:

- a) Which part of the graph refers to the existence of the substance in liquid state only?

➤ (BC).

- b) Which part of the graph refers to the existence of the substance in both liquid and gas states?

➤ (CD).

- c) Which part of the graph refers to melting process?

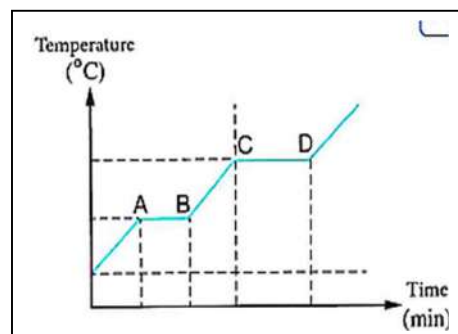
➤ (AB).

- d) Which point(s) represents the boiling point?

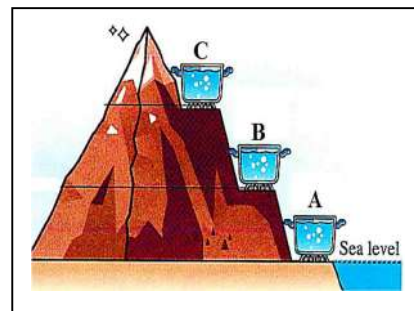
➤ (C & D).

- e) In which part(s) of the graph, does the temperature of the substance remains constant?

➤ (AB) and (CD).



2- Study the opposite figure, then complete:



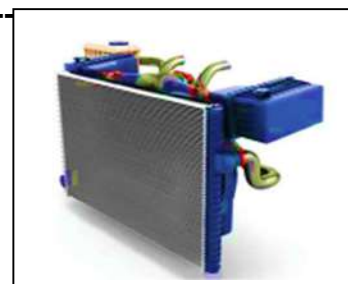
- The lowest boiling point of water is at the point (C).
- At point (A), the boiling point of water is 100°C .
- The atmospheric pressure at point (B) is higher than that at point (C) and lower than that at point (A).
- The atmospheric pressure at point (A) is called normal atmospheric pressure.
- The correct descending order of boiling point of water at these points is $A > B > C$.
- What is the boiling point of water at the point (C), if its altitude is 4800m?
 - The amount of decrease in temperature = $4800 \div 300 = 16^{\circ}\text{C}$.
 - The boiling point of water at point (C) = $100 - 16 = 84^{\circ}\text{C}$.

3- Study the opposite table, then complete:

Substance	X	Y	Z
Specific heat (j/Kg. $^{\circ}\text{C}$)	450	900	2000

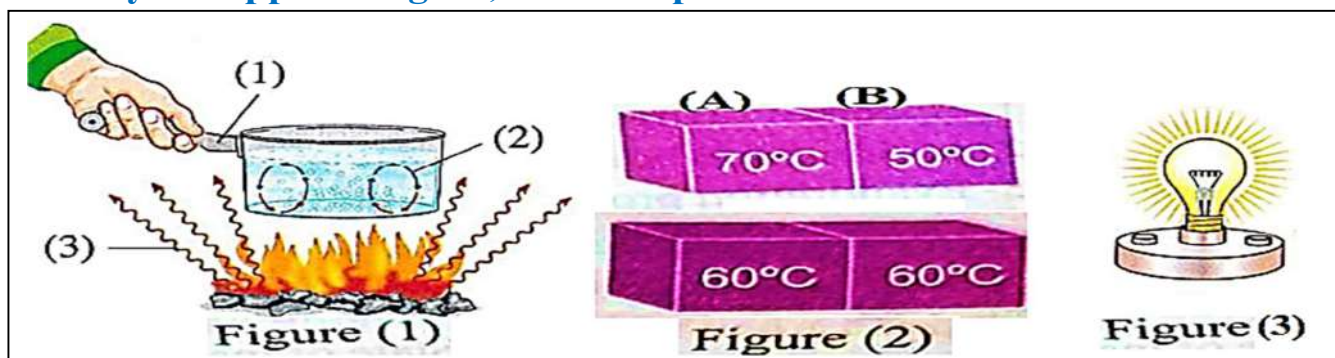
- The substance that requires the least amount of heat per kilogram to raise its temperature by 1°C is substance (X).
- The material that needs the longest time to gain the same amount of heat until its temperature rises by 1°C is substance (Z).
- What happens when two equal masses of substances (X) and (Y) are heated over a steady flame for 5 minutes? And why?
 - The temperature of substance (X) rises more than that of substance (Y), because substance (X) has lower specific heat.

4- Study the opposite figure, then complete:



- The figure shows radiator that is cooling system connected to car engines.
- The liquid used in the figure is water, because it has higher specific heat.

5- Study the opposite figure, then complete:



- a) In figure (1), methods of heat transfer are:
1- conduction. 2 – convection. 3 – radiation.
- b) In figure (2), heat transfers between the two copper cubes from cube (A) to cube (B) by conduction.
- c) In figure (2), heat transfer stops between the two copper cubes because they reach a state called thermal equilibrium, where temperatures of the two cubes become equal.
- d) In figure (3), heat transfers by convection and radiation.

13) Variant questions:

1- Mention: four assumptions about the particle theory of matter.

- All matters are made up of particles (molecules) that are so tiny.
- The particles store potential energy due to the forces of attraction between them.
- The particles have kinetic energy due to their continuous motion in straight lines.
- There are interparticle spaces between the particles.

2- Identify the factors affecting each of the following:

- a) **State of matter:** temperature, kinetic energy, forces of attraction between molecules and interparticle spaces between the particles.
- b) **The speed of diffusion:** The temperature of the diffusion medium and the mass of molecules

- c) **Melting and boiling points:** atmospheric pressure and the degree of purity.
 - d) **The rate of liquid evaporation:** temperature, surface area, speed of air currents, and humidity.
 - e) **Change in the temperature of objects:** Mass of the substance, type of the substance and state of the substance.
 - f) **The temperature of a body (system):** lose or gain of thermal energy (heat transfer from or to the system).
-

3- Mention a technological (or life) application that based on:

- a) **Effect of pressure on boiling point:** Pressure cooker (steam pot).
- b) **Effect of the surface area on evaporation rate:** Instant coffee.
- c) **Water as an excellent cooling liquid:** radiator.
- d) **Heat transfer by conduction:**
 - The manufacture of cooking utensils from metals.
 - The cooling systems of electronic devices
- e) **Heat transfer by convection:** sea breeze phenomenon in summer.
- f) **Heat transfer by radiation:**
 - Thermography.
 - Firefighters wear shiny silver clothing.

4- An empty closed container its volume is 200 cm^3 , if 50 cm^3 of air is removed from it. What is the volume of air remaining in the container? Explain why.

- The volume of air remaining in the container is 200 cm^3 , because gas matter has very weak attraction forces between its particles, which allows them to move randomly and completely freely, so it takes the shape of the container that holds it.
-

5- If you know that the specific heat of 1 kg of iron is $450 \text{ J/kg}^\circ\text{C}$. What is the specific heat of 10 kg of iron? With explanation.

- $450 \text{ J/kg}^\circ\text{C}$, because the specific heat is a characteristic property of a substance that is a constant value for each substance but differ according to the type and state of substance.
-

6- Arrange each group according to what is required in the brackets:

a) Wood – Oxygen – Oil.

(In ascending order according to the attraction forces between particles)

- $\text{Oxygen} < \text{Oil} < \text{Wood}$.

b) Spong – Air – Water.

(In ascending order according to diffusibility)

- Diffusibility through: $\text{Spong} < \text{Water} < \text{Air}$.

c) Copper - Diamond- Silver.

(In descending order according to their thermal conductivity)

- $\text{Diamonds} > \text{silver} > \text{copper}$.

Prep 2 Final Revision on unit 2

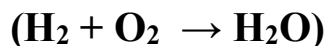
1) Choose the correct answer:

- 1- All of the following expresses a physical change except.....
a) the conversion of charcoal to ash. b) iodine sublimation.
c) the heating of an iron rod. d) the melting of ice.
- 2- When a quantity of salt is dissolved in water,.....
a) a new substance is produced. b) salt loses its taste.
c) a physical change occurs. d) a chemical change occurs.
- 3- All the following changes produce new substances, except
a) frying the eggs. b) ice melting. c) fuel combustion. d) iron rust.
- 4- The chemical reaction between sulphuric acid and sodium bicarbonate is indicated by.....
a) formation of a white powder. b) Colour change.
c) formation of a precipitate. d) formation of gas bubbles.
- 5- The scientific name of vinegar is.....
a) hydrochloric acid. b) sulphuric acid. c) acetic acid. d) nitric acid.
- 6- Soap and oil.....
a) have the same properties. b) are reactants.
c) have different properties. d) are products.
- 7- The chemical formula of sulphuric acid is.....
a) Na_2SO_4 . b) H_2SO_4 . c) HCl . d) CuSO_4 .
- 8-indicate the occurrence of a chemical reaction when iron rust.
a) Occurrence of effervescence b) Colour change
c) Formation of a precipitate d) Evolution of gas
- 9- The symbol (aq) is written below to the right of the molecular formula of the compound that exists in the state.
a) solid b) liquid c) vapour d) aqueous solution
- 10- When 12 g of carbon burns in pure oxygen, to form 44 g of carbon dioxide, the mass of oxygen consumed in the combustion is.....g.
a) 8 b) 16 c) 22 d) 32

11- The subscript of phosphorus in ($3\text{H}_3\text{PO}_4$) is.....

- a) 1 b) 2 c) 3 d) 4

12- Sum of the coefficients of the following equation after balancing:



- a) 2 b) 3 c) 5 d) 7

13- In the balanced equation: $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

The sum of the coefficients of the products and the sum of the subscripts of the reactants are.....and.....respectively.

- a) 5 , 4 b) 4 , 7 c) 7 , 4 d) 5 , 7

14- After balancing the opposite equation: $2\text{Fe} + n\text{Cl}_2 \rightarrow 2\text{FeCl}_3$

the value of (n) is.....

- a) 1 b) 2 c) 3 d) 4

15-solution used to detect the presence of starch.

- a) Benedict's b) Iodine c) Biuret d) Sudan (IV)

16- The number of water molecules resulting from the conversion of 2 units of glucose to maltose is.....

- a) 1 b) 2 c) 3 d) 4

17-can't be hydrolyzed into simpler substances.

- a) Sucrose b) Glucose c) Starch d) Maltose

18-are oligosaccharides.

- a) Sucrose and glucose b) Glucose and fructose
c) Fructose and maltose d) Sucrose and maltose

19- Eggs and milk are rich in.....

- a) carbohydrates and fats. b) fats and proteins.
c) carbohydrates and proteins. d) Disaccharides and proteins.

20-give a violet colour when mixed with Biuret solution.

- a) Glucose b) Proteins c) Starch d) Fats

21- Soybeans are rich in plant....., while vegetable oils are rich in.....

- a) carbohydrates / fats. b) fats / proteins.
c) carbohydrates / proteins. d) proteins / fats.

22- Medicine capsules are made of.....

- a) carbohydrates. b) fats. c) proteins. d) cholesterol

- 23-** Enzymes and antibodies are
 a) carbohydrates. b) fats. c) proteins. d) sugars
- 24-** Carbohydrates are used in manufacture of all the following, except.....
 a) medicine capsules. b) paper.
 c) laundry detergents. d) some cosmetics.
- 25-** The non-essential element which may be found in proteins is.....
 a) phosphorus. b) carbon. c) nitrogen. d) oxygen.
- 26-** Amino acids are converted into proteins by.....
 a) hormones. b) antibodies. c) acids. d) enzymes.
- 27-**is extracted from animal bones and animals skins.
 a) Gelatin. b) Glucose. c) Insulin. d) cholesterol.
- 28-**are not considered a main source of energy.
 a) Carbohydrates. b) Fats. c) Proteins. d) Sugars

2) Complete the following statements:

- 1-** Dissolving sugar in water is achange, while burning the sugar is achange.
- 2-** The change of milk into yogurt is achange, while the melting of wax is achange.
- 3-** The scientific name ofis calcium hydroxide solution, while its chemical formula is
- 4-** The scientific name of baking soda is, while its chemical formula is
- 5-** Whenprecipitate is exposed to sunlight, it becomes violet.
- 6-** Whenis added to copper sulphate solution, zinc sulphate solution is formed andis deposited.
- 7-** The scientific name of caustic soda is, while its chemical formula is
- 8-** Soap is formed by the reaction ofwith solution, which is indicated by change of
- 9-** Ignition of fireworks are accompanied by the emission of and

- 10- In the symbolic chemical equation, the symbol (g) refers to the matter that is in thestate.
- 11- In the symbolic chemical equation, the symbol (Δ) refers to.....
- 12- According to the law of conservation of mass, the total mass of the reactants in a reaction isthe total mass of the products.
- 13- When g of calcium carbonate is heated, 56 g of calcium oxide and 44 g of carbon dioxide gas are produced.
- 14- Total sum of subscripts of the atomic groups in $(\text{NH}_4)_2\text{SO}_4$ is.....
- 15- Nutrients are classified into,and proteins.
- 16- Carbohydrates are organic chemical compounds composed of,, and
- 17- Among the most important sources of carbohydrates are, potatoes and
- 18- Grape sugar is known as, while fruit sugar is known as.....
- 19- Cane sugar is known as, while malt sugar is known as.....
- 20-andare polysaccharides.
- 21- The excess glucose in the body is stored in the form ofin the body's cells.
- 22- Insufficient secretion ofhormone leads to accumulation of glucose in the blood that results indisease.
- 23- In the highly concentrated glucose sugar solution, Benedict's solution colour changed fromto
- 24-participate in supporting the brain functions, whileparticipate in the formation of antibodies that support thesystem.
- 25-are the basic units of proteins and they are..... in water.
- 26-solution colour changes from blue towhen added to proteins.

- 27- Carbohydrates andare essential substances for transporting and storingin cells.
- 28- The egg yolk is rich in, while albumen is rich in.....
- 29- The basic elements involved in the composition of proteins are....., hydrogen, oxygen and
- 30- Enzymes act asin the conversion of into proteins.

3) Write the scientific term:

- 1- Changes result in new substances whose properties differ from those of the original substances.
- 2- A gas produced by the reaction of sodium bicarbonate with dilute acetic acid.
- 3- A solid substance produced from the reaction of oil with caustic soda solution.
- 4- Change the colour of iron when it is exposed to moist atmospheric oxygen.
- 5- Symbolic representation of a chemical reaction, showing the integer ratio of the number of molecules or atoms Of reactants and products.
- 6- The state of the salts which are dissolved in water.
- 7- The scientist who formulated the law of conservation of mass.
- 8- One of the branches of chemistry concerned with studying types of food materials.
- 9- The simplest form of carbohydrates that can't be hydrolyzed.
- 10- Sugars composed of two monosaccharide units.
- 11- A polysaccharide substance found abundantly in potatoes.
- 12- The disease resulting from a deficiency in the secretion of the insulin hormone.
- 13- A fatty substance whose deposition on the inside walls of the arteries leads to heart risks.

14- Proteins that can be used as catalysts.

15- Food substances that are not considered a main sources of energy.

4) What is meant by:

1- Chemical reaction.

➤

2- Catalyst.

➤

3- Law of conservation of matter.

➤

4- Law of Conservation of Mass.

➤

5- Balanced symbolic equation.

➤

6- Oligosaccharides.

➤

7- Polysaccharides

➤

5) Put (√) or (x):

1- Physical changes do not change the chemical composition of the substance. ()

2- Chemical reaction includes the change of products into reactants. ()

3- Burning the sugar changes its apparent properties. ()

4- The melting of the ice results in a new substance. ()

5- The reaction of magnesium with hydrochloric acid can be indicated by the formation of a precipitate. ()

6- The odors that appear during the process of cooking food are evidence of physical changes. ()

7- When fireworks are lit, a chemical reaction occurs with the emission of light and heat. ()

- 8- The chemical formula of hydrochloric acid is HCl. ()
- 9- In the symbolic chemical equation, the symbol (dil.) indicates the use of concentrated acid. ()
- 10- In a chemical reaction, the atoms of the reactants are rearranged to form new products with the same number of atoms for each element. ()
- 11- The subscript of ammonium group in NH_4Cl is equal to 4. ()
- 12- Balancing chemical equation should be accomplished by changing the coefficients and not the subscripts. ()
- 13- Carbohydrates involved in the composition of the flowers nectar. ()
- 14- Grapes and potatoes are rich in fats. ()
- 15- It is recommended to reduce white carbohydrates such as white sugar and white flour. ()
- 16- When one molecule of oxygen is removed from two monosaccharide units, a disaccharide unit is formed. ()
- 17- Cane sugar consists of two similar units. ()
- 18- The medium concentration of glucose sugar forms an orange colour with Benedict's solution. ()
- 19- The accumulation of glucose in the blood is due to increase in secretion of insulin hormone. ()
- 20- Sudan (IV) solution forms red-orange colour on the surface of carbohydrates. ()
- 21- Diabetes is caused by a hormonal deficiency. ()
- 22- Biuret solution is used to detect proteins in egg yolk. ()
- 23- Fats provide the body with twice energy that carbohydrates do. ()
- 24- Fats and proteins composed of the same chemical substances. ()
- 25- Phosphorus may be present in the composition of proteins. ()
- 26- Not all types of nutrients considered a sources of energy. ()

6) Correct the underlined words:

- 1- One of the indications of chemical reactions is the formation of gas that does not dissolve in water.
- 2- When sugar is burned, a black substance of sulphur is formed.

- 3- Limewater turns milky when hydrogen gas passes through it.
- 4- The change of colour and texture over time indicates a nuclear reaction.
- 5- The chemical formula of silver chloride is NaCl.
- 6- Copper rusts when exposed to moist atmospheric oxygen.
- 7- Number of oxygen atoms in $\text{Al}_2(\text{SO}_4)_3$ is 4.
- 8- The presence of a substance dissolved in water during the chemical reaction indicates the formation of a precipitate.
- 9- The scientist Robert Brown is called the father of chemistry.
- 10- The chemical formula of sodium nitrate is NaNO_2 .
- 11- Maltose sugar consists of two different units.
- 12- Disaccharides consist of more than 10 units of monosaccharides.
- 13- The excess carbohydrates are stored in the liver and muscles in form of starch.
- 14- The blue colour of Benedict's solution changes in glucose solutions according to their viscosity.
- 15- Low concentrated glucose sugar forms red colour with Benedict's solution.
- 16- Glycogen is a polysaccharide that forms the cell walls of plant cells.
- 17- Stability of glucose levels in blood can be maintained by reducing intake of fats and fried foods.
- 18- Yogurt and eggs are sources of carbohydrates.
- 19- Increased urination may be a sign of heart disease.
- 20- Meat, cheese and eggs are foods rich in fats and carbohydrates.
- 21- Fats used in the formation of enzymes that act as catalysts.
- 22- Coloured granules in powder detergent contain hormones.

7) Cross out the odd word and write the scientific term of others:

- 1- Moldy bread / Melting of candle / Fireworks / frying egg.
- 2- Wood cutting / Water evaporation / Dissolution of sugar in water / Burning sugar.
- 3- Carbon / Hydrogen / Sulphur / Oxygen.

4- Cholesterol / Glucose /Maltose / Fructose.

5- Bread / Potatoes / Rice / Meat.

6- Butter / Oil / Flour / Milk.

8) Mention the difference between (compare):

1- Physical change and chemical change in terms of definition.

2- Copper sulphate solution and zinc sulphate solution in terms of color.

3- Silver chloride and magnesium oxide in terms of color and solubility.

4- The coefficient and the subscript in chemical equation.

5- Glucose, sucrose, and starch in terms of (type, reagents used for their detection and their sources in food).

6- Sucrose and Maltose in terms of their structure.

9) Give an example for:

1- Physical change.

2- Chemical change.

3- Monosaccharides.

4- Disaccharides.

5- Polysaccharides.

10) Give reason for:

1- The melting of a candle is considered a physical change.

(Adding drops of food coloring additive to a cup of water is not a chemical reaction)

➤

2- The burning of coal is a chemical change.

➤

- 3- A glass bottle filled to the brim with water and tightly closed is broken when placed in the freezer of the fridge is not a chemical reaction.
-
- 4- When a zinc plate is placed in a beaker containing a blue copper sulphate solution, the blue color disappears.
-
- 5- strong odor is emitted when sugar is burned.
-
- 6- A magnesium strip must be held with a tongs before lighting it with a flame.
-
- 7- When burning a magnesium ribbon, you must wear a protective mask.
-
- 8- The chemical equation must be balanced.
-
- 9- The sweet taste of some fruits such as grapes and apples.
-
- 10- Glucose is one of the simplest forms of carbohydrates.
-
- 11- Sucrose is a disaccharide.
-
- 12- The body can fast for several hours without food.
-
- 13- Carbohydrates play an important role in industry.
-
- 14- It is necessary to consume potatoes and rice in moderate quantities.
-
- 15- Benedict's solution forms several colors with glucose solutions.
-
- 16- Diabetes is caused by a hormonal deficiency.
-

17- When iodine is added to potatoes, the iodine solution turns blue.

➤

18- Biuret solution turns from blue to purple when added to egg whites.

➤

19- Enzymes have great benefits in industries.

➤

20- There are risks from the excessive use of nutritional supplements.

➤

21- There are multiple sources of proteins in food.

➤

11) What are the results of (What happens...)?

1- Adding silver nitrate solution to sodium chloride solution.

➤

2- Exposing silver chloride precipitate to sunlight.

➤

3- Placing zinc plate in copper sulphate solution.

➤

4- Carbon dioxide gas passes through clear limewater.

➤

5- Placing magnesium strip in a test tube containing dilute hydrochloric acid.

➤

6- Lighting a magnesium ribbon in the air.

➤

7- Heating a spoon with sugar on a flame for a period of time.

➤

8- Adding sodium hydroxide solution to cooking oil.

➤

9- Eggs are fried.

➤

10- Slices of apple or potato are left exposed to the open air.

➤

11- Iron is exposed to moist atmospheric oxygen.

➤

12- Quantities of carbohydrates that exceed the body's needs are consumed.

➤

13- Iodine solution is added to potatoes.

➤

14- Decreased secretion of insulin hormone.

➤

15- Large quantities of butter and eggs are consumed.

➤

16- Benedict's solution is added to a solution free of glucose.

➤

17- Sudan (IV) solution is added to a mixture of egg yolk and water.

➤

18- Biuret solution is added to a mixture of egg whites and water.

➤

12) State one importance for each of the following:

1- Carbohydrates (for living organisms):

2- Cellulose (in industry):

3- Cellulose (for plants):

4- Pancreas:

5- Fats:

6- Proteins (for living organisms):

7- Gelatin:

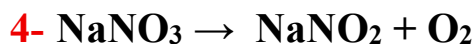
8- Proteins (in genetic engineering):

13) Write the balanced symbolic equations which represent the following reactions, with writing the symbols indicating the physical states:

- 1- Reaction of magnesium metal with dilute hydrochloric acid to form magnesium chloride solution and hydrogen gas.
➤
- 2- Combustion of ethane gas (C₂H₆) in an abundance of oxygen gas to form condensed water vapour and carbon dioxide.
➤
- 3- The reaction of baking soda with dilute hydrochloric acid to form a solution of sodium chloride, water and bubbles of carbon dioxide gas.
➤
- 4- Heating mercury (II) oxide powder strongly to form mercury and oxygen.
➤
- 5- Reaction of magnesium with dilute sulfuric acid to form magnesium sulfate soluble in water and hydrogen gas.
➤
- 6- Reaction of solid iodine with hydrogen gas to form hydrogen iodide gas.
➤
- 7- Reaction of nitrogen gas with hydrogen gas to form ammonia gas.
➤
- 8- Reaction of calcium chloride solution with sodium sulphate solution to form sodium chloride solution and a precipitate of calcium sulphate.
➤

14) Rewrite the following chemical equations after balancing them:

- 1- $\text{Zn} + \text{AgNO}_3 \rightarrow \text{Zn}(\text{NO}_3)_2 + \text{Ag}$
➤
- 2- $\text{Al} + \text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{H}_2$
➤
- 3- $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$
➤



➤



➤



➤



➤



➤

15) Variant questions:

1- Mention some indications of the occurrence of the chemical reaction.

.....
.....
.....

2- What are the laboratory safety precautions when burning a magnesium ribbon?

.....
.....
.....

3- Mention examples of some chemical reactions that occur in daily life.

.....
.....
.....

4- 60 g of carbon reacts with excess of oxygen gas to form 220 g of carbon dioxide gas. After the reaction, 40 g of oxygen gas remains without reaction, Calculate the mass of oxygen gas:

a) Used in the reaction.

b) Before the reaction.

.....
.....
.....

Prep 2 Final Revision on unit 2 (answered)

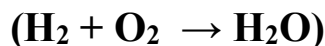
1) Choose the correct answer:

- 1- All of the following expresses a physical change except.....
a) the conversion of charcoal to ash. b) iodine sublimation.
c) the heating of an iron rod. d) the melting of ice.
- 2- When a quantity of salt is dissolved in water,.....
a) a new substance is produced. b) salt loses its taste.
c) a physical change occurs. d) a chemical change occurs.
- 3- All the following changes produce new substances, except
a) frying the eggs. b) ice melting. c) fuel combustion. d) iron rust.
- 4- The chemical reaction between sulphuric acid and sodium bicarbonate is indicated by.....
a) formation of a white powder. b) Colour change.
c) formation of a precipitate. d) formation of gas bubbles.
- 5- The scientific name of vinegar is.....
a) hydrochloric acid. b) sulphuric acid. c) acetic acid. d) nitric acid.
- 6- Soap and oil.....
a) have the same properties. b) are reactants.
c) have different properties. d) are products.
- 7- The chemical formula of sulphuric acid is.....
a) Na_2SO_4 . b) H_2SO_4 . c) HCl . d) CuSO_4 .
- 8-indicate the occurrence of a chemical reaction when iron rust.
a) Occurrence of effervescence b) Colour change
c) Formation of a precipitate d) Evolution of gas
- 9- The symbol (aq) is written below to the right of the molecular formula of the compound that exists in the state.
a) solid b) liquid c) vapour d) aqueous solution
- 10- When 12 g of carbon burns in pure oxygen, to form 44 g of carbon dioxide, the mass of oxygen consumed in the combustion is.....g.
a) 8 b) 16 c) 22 d) 32

11- The subscript of phosphorus in ($3\text{H}_3\text{PO}_4$) is.....

- a) 1 b) 2 c) 3 d) 4

12- Sum of the coefficients of the following equation after balancing:



- a) 2 b) 3 c) 5 d) 7

13- In the balanced equation: $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

The sum of the coefficients of the products and the sum of the subscripts of the reactants are.....and.....respectively.

- a) 5 , 4 b) 4 , 7 c) 7 , 4 d) 5 , 7

14- After balancing the opposite equation: $2\text{Fe} + n\text{Cl}_2 \rightarrow 2\text{FeCl}_3$

the value of (n) is.....

- a) 1 b) 2 c) 3 d) 4

15-solution used to detect the presence of starch.

- a) Benedict's b) Iodine c) Biuret d) Sudan (IV)

16- The number of water molecules resulting from the conversion of 2 units of glucose to maltose is.....

- a) 1 b) 2 c) 3 d) 4

17-can't be hydrolyzed into simpler substances.

- a) Sucrose b) Glucose c) Starch d) Maltose

18-are oligosaccharides.

- a) Sucrose and glucose b) Glucose and fructose
c) Fructose and maltose d) Sucrose and maltose

19- Eggs and milk are rich in.....

- a) carbohydrates and fats. b) fats and proteins.
c) carbohydrates and proteins. d) Disaccharides and proteins.

20-give a violet colour when mixed with Biuret solution.

- a) Glucose b) Proteins c) Starch d) Fats

21- Soybeans are rich in plant....., while vegetable oils are rich in.....

- a) carbohydrates / fats. b) fats / proteins.
c) carbohydrates / proteins. d) proteins / fats.

22- Medicine capsules are made of.....

- a) carbohydrates. b) fats. c) proteins. d) cholesterol

- 23- Enzymes and antibodies are
 a) carbohydrates. b) fats. c) proteins. d) sugars
- 24- Carbohydrates are used in manufacture of all the following, except.....
 a) medicine capsules. b) paper.
 c) laundry detergents. d) some cosmetics.
- 25- The non-essential element which may be found in proteins is.....
 a) phosphorus. b) carbon. c) nitrogen. d) oxygen.
- 26- Amino acids are converted into proteins by.....
 a) hormones. b) antibodies. c) acids. d) enzymes.
- 27-is extracted from animal bones and animals skins.
 a) Gelatin. b) Glucose. c) Insulin. d) cholesterol.
- 28-are not considered a main source of energy.
 a) Carbohydrates. b) Fats. c) Proteins. d) Sugars

2) Complete the following statements:

- 1- Dissolving sugar in water is a physical change, while burning the sugar is a chemical change.
- 2- The change of milk into yogurt is a chemical change, while the melting of wax is a physical change.
- 3- The scientific name of limewater is calcium hydroxide solution, while its chemical formula is Ca(OH)₂.
- 4- The scientific name of baking soda is sodium bicarbonate, while its chemical formula is NaHCO₃.
- 5- When silver chloride precipitate is exposed to sunlight, it becomes violet.
- 6- When zinc is added to copper sulphate solution, zinc sulphate solution is formed and copper is deposited.
- 7- The scientific name of caustic soda is sodium hydroxide, while its chemical formula is NaOH.
- 8- Soap is formed by the reaction of oil with sodium hydroxide solution, which is indicated by change of consistency.
- 9- Ignition of fireworks are accompanied by the emission of light and heat.

- 10- In the symbolic chemical equation, the symbol (g) refers to the matter that is in the gaseous state.
- 11- In the symbolic chemical equation, the symbol (Δ) refers to heating.
- 12- According to the law of conservation of mass, the total mass of the reactants in a reaction is equal to the total mass of the products.
- 13- When 100 g of calcium carbonate is heated, 56 g of calcium oxide and 44 g of carbon dioxide gas are produced.
- 14- Total sum of subscripts of the atomic groups in $(\text{NH}_4)_2\text{SO}_4$ is 3.
- 15- Nutrients are classified into carbohydrates, fats and proteins.
- 16- Carbohydrates are organic chemical compounds composed of carbon, hydrogen, and oxygen.
- 17- Among the most important sources of carbohydrates are bread, potatoes and rice.
- 18- Grape sugar is known as glucose, while fruit sugar is known as fructose.
- 19- Cane sugar is known as sucrose, while malt sugar is known as maltose.
- 20- Starch and cellulose are polysaccharides.
- 21- The excess glucose in the body is stored in the form of fats in the body's cells.
- 22- Insufficient secretion of insulin hormone leads to accumulation of glucose in the blood that results in diabetes disease.
- 23- In the highly concentrated glucose sugar solution, Benedict's solution colour changed from blue to red.
- 24- Carbohydrates participate in supporting the brain functions, while proteins participate in the formation of antibodies that support the immune system.
- 25- Amino acids are the basic units of proteins and they are soluble in water.
- 26- Biuret solution colour changes from blue to violet when added to proteins.
- 27- Carbohydrates and fats are essential substances for transporting and storing energy in cells.
- 28- The egg yolk is rich in fat, while albumen is rich in proteins.

29- The basic elements involved in the composition of proteins are carbon, hydrogen, oxygen and nitrogen.

30- Enzymes act as catalysts in the conversion of amino acids into proteins.

3) Write the scientific term:

- 1- Changes result in new substances whose properties differ from those of the original substances. (Chemical changes)
- 2- A gas produced by the reaction of sodium bicarbonate with dilute acetic acid. (Carbon dioxide)
- 3- A solid substance produced from the reaction of oil with caustic soda solution. (Soap)
- 4- Change the colour of iron when it is exposed to moist atmospheric oxygen. (Iron rusting)
- 5- Symbolic representation of a chemical reaction, showing the integer ratio of the number of molecules or atoms Of reactants and products. (Symbolic chemical equation)
- 6- The state of the salts which are dissolved in water. (Aqueous solution)
- 7- The scientist who formulated the law of conservation of mass. (Antoine Lavoisier)
- 8- One of the branches of chemistry concerned with studying types of food materials. (Nutritional chemistry)
- 9- The simplest form of carbohydrates that can't be hydrolyzed. (Monosaccharides)
- 10- Sugars composed of two monosaccharide units. (Disaccharides)
- 11- A polysaccharide substance found abundantly in potatoes. (Starch)
- 12- The disease resulting from a deficiency in the secretion of the insulin hormone. (Diabetes)
- 13- A fatty substance whose deposition on the inside walls of the arteries leads to heart risks. (Cholesterol)
- 14- Proteins that can be used as catalysts. (Enzymes)
- 15- Food substances that are not considered a main sources of energy. (Proteins)

4) What is meant by:

1- Chemical reaction.

- The process of breaking the bonds between atoms of reactants and forming new bonds between atoms of the products.

2- Catalyst.

- A substance that increases the rate of chemical reaction without being consumed or changed.

3- Law of conservation of matter.

- Matter is neither destroyed nor created from nothing, but it is transformed from one form to another.

4- Law of Conservation of Mass.

- The total mass of the reactants is equal to the total mass of the products.

5- Balanced symbolic equation.

- A symbolic chemical equation in which the number of atoms of each element of the reactants is equal to the number of atoms of the same element in the products.

6- Oligosaccharides.

- They are sugars that composed of 2 to 10 monosaccharide units.

7- Polysaccharides

- They are sugars that composed of more than 10 monosaccharide units.

5) Put (√) or (x):

- 1- Physical changes do not change the chemical composition of the substance. (√)
- 2- Chemical reaction includes the change of products into reactants. (x)
- 3- Burning the sugar changes its apparent properties. (√)
- 4- The melting of the ice results in a new substance. (x)
- 5- The reaction of magnesium with hydrochloric acid can be indicated by the formation of a precipitate. (x)
- 6- The odors that appear during the process of cooking food are evidence of physical changes. (x)

- 7- When fireworks are lit, a chemical reaction occurs with the emission of light and heat. (✓)
- 8- The chemical formula of hydrochloric acid is HCl. (✓)
- 9- In the symbolic chemical equation, the symbol (dil.) indicates the use of concentrated acid. (x)
- 10- In a chemical reaction, the atoms of the reactants are rearranged to form new products with the same number of atoms for each element. (✓)
- 11- The subscript of ammonium group in NH_4Cl is equal to 4. (x)
- 12- Balancing chemical equation should be accomplished by changing the coefficients and not the subscripts. (✓)
- 13- Carbohydrates involved in the composition of the flowers nectar. (✓)
- 14- Grapes and potatoes are rich in fats. (x)
- 15- It is recommended to reduce white carbohydrates such as white sugar and white flour. (✓)
- 16- When one molecule of oxygen is removed from two monosaccharide units, a disaccharide unit is formed. (x)
- 17- Cane sugar consists of two similar units. (x)
- 18- The medium concentration of glucose sugar forms an orange colour with Benedict's solution. (✓)
- 19- The accumulation of glucose in the blood is due to increase in secretion of insulin hormone. (x)
- 20- Sudan (IV) solution forms red-orange colour on the surface of carbohydrates. (x)
- 21- Diabetes is caused by a hormonal deficiency. (✓)
- 22- Biuret solution is used to detect proteins in egg yolk. (x)
- 23- Fats provide the body with twice energy that carbohydrates do. (✓)
- 24- Fats and proteins composed of the same chemical substances. (x)
- 25- Phosphorus may be present in the composition of proteins. (✓)
- 26- Not all types of nutrients considered a sources of energy. (✓)

6) Correct the underlined words:

- 1- One of the indications of chemical reactions is the formation of gas that does not dissolve in water. (precipitate)
- 2- When sugar is burned, a black substance of sulphur is formed. (carbon)
- 3- Limewater turns milky when hydrogen gas passes through it. (carbon dioxide)
- 4- The change of colour and texture over time indicates a nuclear reaction. (chemical)
- 5- The chemical formula of silver chloride is NaCl. (AgCl)
- 6- Copper rusts when exposed to moist atmospheric oxygen. (Iron)
- 7- Number of oxygen atoms in $\text{Al}_2(\text{SO}_4)_3$ is 4. (12)
- 8- The presence of a substance dissolved in water during the chemical reaction indicates the formation of a precipitate. (aqueous solution)
- 9- The scientist Robert Brown is called the father of chemistry. (Antoine Lavoisier)
- 10- The chemical formula of sodium nitrate is NaNO_2 . (NaNO_3)
- 11- Maltose sugar consists of two different units. (Sucrose)
- 12- Disaccharides consist of more than 10 units of monosaccharides. (Polysaccharides)
- 13- The excess carbohydrates are stored in the liver and muscles in form of starch. (glycogen)
- 14- The blue colour of Benedict's solution changes in glucose solutions according to their viscosity. (concentrations)
- 15- Low concentrated glucose sugar forms red colour with Benedict's solution. (green)
- 16- Glycogen is a polysaccharide that forms the cell walls of plant cells. (Cellulose)
- 17- Stability of glucose levels in blood can be maintained by reducing intake of fats and fried foods. (cholesterol)
- 18- Yogurt and eggs are sources of carbohydrates. (fats)
- 19- Increased urination may be a sign of heart disease. (diabetes)

20- Meat, cheese and eggs are foods rich in fats and carbohydrates.

(proteins)

21- Fats used in the formation of enzymes that act as catalysts. (Proteins)

22- Coloured granules in powder detergent contain hormones. (enzymes)

7) Cross out the odd word and write the scientific term of others:

1- Moldy bread / Melting of candle / Fireworks / frying egg.

➤ Scientific term: **chemical changes**.

2- Wood cutting / Water evaporation / Dissolution of sugar in water / Burning sugar.

➤ Scientific term: **Physical changes**.

3- Carbon / Hydrogen / Sulphur / Oxygen.

➤ Scientific term: **main elements that form carbohydrates and fats**.

4- Cholesterol / Glucose / Maltose / Fructose.

➤ Scientific term: **carbohydrates**.

5- Bread / Potatoes / Rice / Meat.

➤ Scientific term: **food rich in carbohydrates**.

6- Butter / Oil / Flour / Milk.

➤ Scientific term: **food rich in fats**.

8) Mention the difference between (compare):

1- Physical change and chemical change in terms of definition.

Physical change	Chemical change
It is a change in the state or shape of a substance without changing its chemical composition.	It is a change that results in new substances with different chemical properties from those of the original substances.

2- Copper sulphate solution and zinc sulphate solution in terms of color.

Copper sulphate solution	Zinc sulphate solution
Blue.	Colorless.

3- Silver chloride and magnesium oxide in terms of color and solubility.

P.O.C.	Silver chloride	Magnesium oxide
Color	White.	White.
Solubility	insoluble.	Soluble.

4- The coefficient and the subscript in chemical equation.

The coefficient	The subscript
The numbers that precede the symbols of the elements or the molecular formulas of the compounds.	The numbers located below the symbols of the elements that make up the molecule.
It represents the simplest integer ratio at which the reactants react together to form the products.	It represents the number of atoms in a single molecule.

5- Glucose, sucrose, and starch in terms of (type, reagents used for their detection and their sources in food).

P.O.C.	Glucose	Starch
Type	Monosaccharide.	Polysaccharide.
Detection	Benedict's solution.	Iodine solution.
Sources	Grapes.	Potatoes.

6- Sucrose and Maltose in terms of their structure.

Sucrose	Maltose
It consists of one glucose unit and one fructose unit.	It consists of two glucose units.

9) Give an example for:

1- Physical change.

2- Chemical change.

3- Monosaccharides.

4- Disaccharides.

5- Polysaccharides.

(Melting of ice)

(Combustion of wood)

(Glucose)

(Sucrose)

(Starch)

10) Give reason for:

- 1- The melting of a candle is considered a physical change.**
(Adding drops of food coloring additive to a cup of water is not a chemical reaction)
 - Because it is not accompanied by a change in chemical composition.
- 2- The burning of coal is a chemical change.**
 - Because it is accompanied by a change in chemical composition and formation of new substances whose properties differ from those of the original substances.
- 3- A glass bottle filled to the brim with water and tightly closed is broken when placed in the freezer of the fridge is not a chemical reaction.**
 - Because the expansion of water during freezing does not lead to a change in the chemical composition of water or glass.
- 4- When a zinc plate is placed in a beaker containing a blue copper sulphate solution, the blue color disappears.**
 - Due to the occurrence of a chemical reaction and formation of colorless zinc sulphate solution.
- 5- strong odor is emitted when sugar is burned.**
 - Due to the occurrence of a chemical reaction that results in the formation of caramel.
- 6- A magnesium strip must be held with a tongs before lighting it with a flame.**
 - To avoid burns during its combustion.
- 7- When burning a magnesium ribbon, you must wear a protective mask.**
 - To avoid damage from the bright light.
- 8- The chemical equation must be balanced.**
 - To verify the law of conservation of matter (conservation of mass).
- 9- The sweet taste of some fruits such as grapes and apples.**
 - Because they are rich in carbohydrates that are responsible for the sweet taste.

10- Glucose is one of the simplest forms of carbohydrates.

- Because it is a monosaccharide that can't be hydrolyzed into simpler substances.

11- Sucrose is a disaccharide.

- Because it consists of two different monosaccharides which are one glucose unit and one fructose unit.

12- The body can fast for several hours without food.

- Because the body stores the excess sugar in the form of glycogen (in liver and muscles) or in the form of fats (in body cells), which are burned when needed during periods of fasting.

13- Carbohydrates play an important role in industry.

- Because they are used in manufacture of paper, some cosmetics and medicine capsules.

14- It is necessary to consume potatoes and rice in moderate quantities.

- To avoid infection with diabetes disease, as they are rich in carbohydrates.

15- Benedict's solution forms several colors with glucose solutions.

- Because the formed colour depends on the concentration of sugar solution.

16- Diabetes is caused by a hormonal deficiency.

- Because it results from a deficiency in the secretion of the insulin hormone.

17- When iodine is added to potatoes, the iodine solution turns blue.

- Because potatoes starch converts the yellowish brown colour of iodine to dark blue.

18- Biuret solution turns from blue to purple when added to egg whites.

- Because albumen (egg whites) contains proteins.

19- Enzymes have great benefits in industries.

- Because they are used in the manufacture of laundry detergents to remove stains.

20- There are risks from the excessive use of nutritional supplements.

- Because excessive use of dietary supplements containing amino acids causes serious risks to the kidneys and liver.

21- There are multiple sources of proteins in food.

- Because there are:
 - Animal proteins found in meat, eggs, and milk.
 - Plant proteins found in legumes, nuts and soybeans.

11) What are the results of (What happens...)?

1- Adding silver nitrate solution to sodium chloride solution.

- Formation of a white precipitate of silver chloride.

2- Exposing silver chloride precipitate to sunlight.

- Its white colour has changed into violet.

3- Placing zinc plate in copper sulphate solution.

- Disappearance of the blue colour of the copper sulphate solution, due to the formation of colorless zinc sulphate solution and reddish brown copper is deposited.

4- Carbon dioxide gas passes through clear limewater.

- The clear limewater turns milky (turbid).

5- Placing magnesium strip in a test tube containing dilute hydrochloric acid.

- Occurrence of effervescence and formation of bubbles of hydrogen gas.

6- Lighting a magnesium ribbon in the air.

- The strip glows with emission of heat and light, then it converts into a white powder of magnesium oxide.

7- Heating a spoon with sugar on a flame for a period of time.

- The sugar turns black with the evolution of smoke and a strong odor.

8- Adding sodium hydroxide solution to cooking oil.

- The liquid mixture turns into solid soap.

9- Eggs are fried.

- Change in the colour and texture of both white and yellow parts.

10- Slices of apple or potato are left exposed to the open air.

➤ The colour of slices turns brown.

11- Iron is exposed to moist atmospheric oxygen.

➤ The iron rusts and changes its colour.

12- Quantities of carbohydrates that exceed the body's needs are consumed.

➤ Pancreas secretes insulin hormone to make the body store the excess sugar in the form of glycogen (in liver and muscles) or in the form of fats (in body cells).

13- Iodine solution is added to potatoes.

➤ Potatoes starch converts the yellowish brown colour of iodine to dark blue.

14- Decreased secretion of insulin hormone.

➤ Accumulation of glucose in the blood that results in diabetes disease.

15- Large quantities of butter and eggs are consumed.

➤ Cholesterol levels in the blood may increase causing blockage of arteries that increases the risk of heart diseases.

16- Benedict's solution is added to a solution free of glucose.

➤ No change in the blue color of Benedict's solution will occur.

17- Sudan (IV) solution is added to a mixture of egg yolk and water.

➤ It gives a red-orange colour on the surfaces of the mixtures.

18- Biuret solution is added to a mixture of egg whites and water.

➤ Its colour changes from blue to violet.

12) State one importance for each of the following:

1- Carbohydrates (for living organisms): source of energy, support the brain functions and participate in forming the nectar of flowers.

2- Cellulose (in industry): used for making paper.

3- Cellulose (for plants): Plant cell walls are made of cellulose.

4- Pancreas: secretes insulin hormone to regulate the level of blood sugar.

5- Fats: provide the body with large amounts of energy.

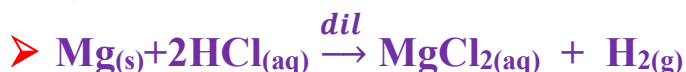
6- Proteins (for living organisms): They are involved in building muscles, repairing and growing damaged cells, formation of enzymes and formation of antibodies.

7- Gelatin: used in food industry.

8- Proteins (in genetic engineering): They are involved in production of insulin which is used in the treatment of diabetes.

13) Write the balanced symbolic equations which represent the following reactions, with writing the symbols indicating the physical states:

1- Reaction of magnesium metal with dilute hydrochloric acid to form magnesium chloride solution and hydrogen gas.



2- Combustion of ethane gas (C₂H₆) in an abundance of oxygen gas to form condensed water vapour and carbon dioxide.



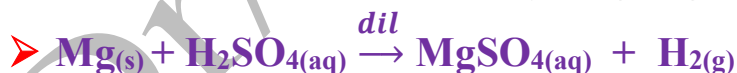
3- The reaction of baking soda with dilute hydrochloric acid to form a solution of sodium chloride, water and bubbles of carbon dioxide gas.



4- Heating mercury (II) oxide powder strongly to form mercury and oxygen.



5- Reaction of magnesium with dilute sulfuric acid to form magnesium sulfate soluble in water and hydrogen gas.



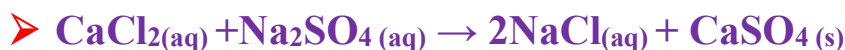
6- Reaction of solid iodine with hydrogen gas to form hydrogen iodide gas.



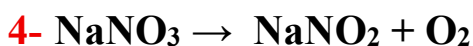
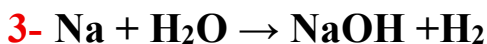
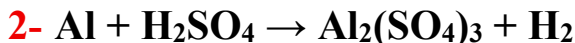
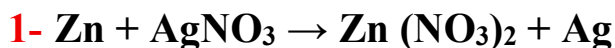
7- Reaction of nitrogen gas with hydrogen gas to form ammonia gas.



8- Reaction of calcium chloride solution with sodium sulphate solution to form sodium chloride solution and a precipitate of calcium sulphate.



14) Rewrite the following chemical equations after balancing them:



15) Variant questions:

1- Mention some indications of the occurrence of the chemical reaction.

* The formation of a precipitate.

* Evolution of a gas.

* Colour change.

* Emission of odor.

* Change in the consistency.

* Emission of light and heat.

2- What are the laboratory safety precautions when burning a magnesium ribbon?

* Use a protective mask.

* Hold the magnesium strip with heat-resistant tongs.

* Don't touch the white powder immediately after the reaction.

3- Mention examples of some chemical reactions that occur in daily life.

➤ When eggs are fried, changes occur in the colour and texture of both white and yellow parts.

➤ When an apple is cut, the apple turns brown.

➤ When an orange goes rotten, its colour changes with the emission of a bad odor.

➤ When fireworks are lit, it causes emission of light and heat.

4- 60 g of carbon reacts with excess of oxygen gas to form 220 g of carbon dioxide gas. After the reaction, 40 g of oxygen gas remains without reaction, Calculate the mass of oxygen gas:

a) Used in the reaction.

b) Before the reaction.



➤ The sum of the reactants masses = The sum of the products masses

$$60 + \text{oxygen} = 220$$

➤ The mass of oxygen gas used in the reaction = $220 - 60 = 160\text{g}$.

➤ The mass of oxygen gas before the reaction = $160 + 40 = 200\text{g}$.

Prep 2 Final Revision on unit 3

1) Choose the correct answer:

- 1-is considered the main factor in Van Helmont's experiment for growth of willow tree.
a) soil b) carbon dioxide c) water d) oxygen
- 2-responsible for light absorption in chloroplasts.
a) thylakoids b) stroma c) cell wall d) outer membrane
- 3- Opaque green objects.....the green light falling on them, while transparent green objects.....the same light.
a) transmit / reflect b) reflect / transmit
c) reflect / absorb d) absorb / reflect
- 4- Opaque red objects red light and the remaining spectrum colours that fall on them through it.
a) transmit / reflect b) reflect / transmit
c) reflect / absorb d) absorb / reflect
- 5- Glucose is formed in.....
a) thylakoids b) stroma c) grana d) outer membrane
- 6- The adenosine unit is linked to.....phosphate groups in ATP molecule.
a) one b) two c) three d) four
- 7- The light dependent reactions require the presence of all the following, except.....
a) sunlight. b) oxygen. c) water. d) chlorophyll.
- 8- The concentration of CO₂ gas at which the rate of photosynthesis is optimum is.....
a) 0.01% b) 0.1% c) 1% d) 10%
- 9- The temperature at which the rate of photosynthesis is optimum.....
a) 2 °C b) 10 °C c) 15 °C d) 20 °C
- 10- All the following substances are used to detect the presence of carbon dioxide gas, except.....
a) sodium hydroxide solution. b) soda lime.
c) methylene blue solution. d) clear limewater.

- 11-** Gases exchange occurs in plant leaves through the.....
- a) stomata b) chlorophyll c) mitochondria d) stroma
- 12-** The plant produces carbon dioxide gas in the process.
- a) photosynthesis b) respiration c) transpiration d) growth
- 13-** Mitochondria carry out.....production.
- a) glucose b) protein c) energy d) fat
- 14-** Mitochondria contain
- a) a folded outer membrane. b) a flat inner membrane.
c) a fluid matrix called cristae . d) matrix containing enzymes.
- 15-** The matrix of mitochondria is where..... reactions occur.
- a) glucose synthesis b) Krebs cycle
c) electron transport chain d) glycolysis
- 16-**reactions occur on the inner membrane of mitochondria.
- a) Photosynthesis b) Krebs cycle
c) electron transport chain d) glycolysis
- 17-** Krebs cycle reactions occur in the presence of.....gas.
- a) O₂ b) CO₂ c) H₂ d) N₂
- 18-** In cellular respiration process, energy is released in form of..... molecules.
- a) glucose b) ATP c) ADP d) oxygen
- 19-** All the following are produced from the second stage of cellular respiration process, except.....
- a) pyruvic acid. b) CO₂ gas.
c) large amount of energy. d) electrons.
- 20-** Limited amount of energy in the form of ATP molecules is formed in.....
- a) electron transport chain and Krebs cycle.
b) glycolysis and Krebs cycle.
c) glycolysis and electron transport chain
d) electron transport chain only.

21- The hydrolysis of five glucose molecules in the cytoplasm of a living cell produces.....molecules of pyruvic acid.

- a) 2 b) 5 c) 6 d) 10

22- All the followings represent anabolic processes except.....

- a) Conversion of glucose into glycogen.
b) Conversion of proteins into amino acids.
c) Growth of muscle fibers.
d) Conversion of fatty acids into fats.

2) Complete the following statements:

- 1-** In the Helmont's experiment, the mass of the soil used was..... slightly, while the tree mass wassignificantly.
- 2-** The process of converting light energy into chemical energy within plants is known asprocess.
- 3-** Plastids are classified into chloroplasts,and..... according to thethat make up them.
- 4-** The pigments responsible for the colour of chloroplasts are found in the.....
- 5-** The herbaceous stems of mallow plant containplastids, while the petals of the flowers containplastids.
- 6-**are the structural units that make up grana.
- 7-** In green plastid, the edges of someare connected to each other by thin membranes.
- 8-** Light dependent reactions take place in, while light independent reactions take place in
- 9-** In lightreactions, chlorophyll absorbsandlight energies from the visible light, to become excited.
- 10-** Energy of active chlorophyll is used in decomposition of..... molecules and the formation ofmolecules.
- 11-**unit formed through the connection between an adenine unit and a ribose sugar unit.

- 12- The molecule of ADP transforms toby a phosphate group.
- 13- The light independent reactions require the presence of and
- 14- To form glucose,combines with CO₂ gas in the presence ofmolecules produced from light dependent reactions and enzymes present in the
- 15- In photosynthesis,molecules of carbon dioxide are converted into only one molecule of
- 16- The efficiency of starch granule storage is high, as seen in the..... of sweet potato andof potato.
- 17- The working principle of vertical farming depends on the use of..... lighting and
- 18- In plants,process occurs during the daytime only, whileprocess occurs during the day and the night.
- 19- Thesolution is used to detect the presence of carbon dioxide.
- 20-is a solid mixture of sodium hydroxide and calcium oxide.
- 21- In chloroplasts,increase the surface area of the thylakoids exposed to light, whileincrease the inner surface area of the mitochondria.
- 22- The first stage of cellular respiration takes place in the, while the second stage takes place in
- 23- The first stage of cellular respiration process occurs in absence of.....
- 24-is decomposed in the first stage of photosynthesis process, whileis decomposed in the first stage of cellular respiration process.
- 25- The Krebs cycle andreactions take place in the..... stage of cellular respiration process.
- 26- The cellular respiration process on the inner membranes of the mitochondria producesandmolecules.

- 27- Metabolism includesandprocesses.
- 28- In metabolic processes, energy ofmolecules is consumed inprocesses.
- 29- Conversion of glucose to glycogen representsprocess, while Cellular respiration representsprocess.
- 30- Conversion of ADP molecules into ATP molecules representsprocess.
- 31- Converting glycogen molecules into glucose molecules during digestion representsprocess.
- 32- Theof proteins from amino acids occurs in the cytoplasm.
- 33- Digestion (Catabolism) of proteins produces, while digestion of starch produces

3) Write the scientific term:

- 1- The process of making food and producing oxygen from sunlight, water, and carbon dioxide.
- 2- Cell organelles found in the green parts of plants and green algae, where the process of photosynthesis occurs.
- 3- Vessels that allow nutrients to move from the leaves to the rest of the plant parts.
- 4- Part of the chloroplast that is composed of structural units called discs.
- 5- A type of pigment inside chloroplasts that gives plant leaves their green colour.
- 6- The ground of the plastid (the matrix) contains the enzymes necessary for photosynthesis.
- 7- The reactions that occur in stroma, without the need for the presence of light.
- 8- Energy molecules which are used in rearranging the atoms during photosynthesis.

- 9- Natural Openings in plant leaves through which they obtain atmospheric oxygen needed for respiration.
- 10- A vital process in which carbon dioxide and oxygen are exchanged with surrounding environment.
- 11- Specialized organelles that resemble beans and found in most the cells.
- 12- The membrane where reactions occur producing the largest amount of ATP molecules.
- 13- Organic molecule resulted from glycolysis in the cytoplasm.
- 14- A device used for effective exercise planning.

4) What is meant by:

1- Stroma.

➤
.....

2- Excited atom.

➤
.....

3- Light dependent reactions.

➤
.....

4- Vertical farming.

➤
.....

5- Cellular respiration process.

➤
.....

6- Metabolism.

➤
.....

5) Put (√) or (x):

- 1- Scientists in ancient times believed that plants obtained their nutrients from the soil. ()
- 2- Van Helmont's experiment on a willow sapling demonstrated the importance of water in plant growth. ()
- 3- Photosynthesis occurs in the green parts of plants, especially in leaves and in green algae. ()
- 4- Chromoplasts are found in plum fruits. ()
- 5- Red transparent sheet absorbs red light. ()
- 6- In photosynthesis, the plant uses carbon dioxide and glucose. ()
- 7- The first stage of photosynthesis takes place in the presence of light and oxygen. ()
- 8- The reactions of thylakoid membranes depend on the presence of light. ()
- 9- Grana contains the enzymes necessary for light independent reactions. ()
- 10- The reactions of stroma in the chloroplast use water molecules. ()
- 11- In the ball and stick model of photosynthesis, the balls represent the elements atoms, while the sticks represent the chemical bonds. ()
- 12- The molecule of ATP transforms to ADP by losing adenine. ()
- 13- ATP molecule consists of an adenosine unit linked to two phosphate groups. ()
- 14- Placing plant leaves in boiled water leads to the breaking of the cell wall. ()
- 15- Absorbing energy by the protons in the stable atom transforms it into an excited atom. ()
- 16- Ethanol is used as a solvent in extracting chlorophyll from plant leaves. ()
- 17- The taro corm is rich in starch. ()
- 18- Water and mineral salts are factors that affect photosynthesis. ()
- 19- The mass of a starch unit is much less than the mass of a glucose unit. ()

- 20- Starch can be stored in the leaves, roots and stems. ()
- 21- Raising the temperature above 20°C leads to an increase in the rate of photosynthesis. ()
- 22- Increasing the concentration of CO₂ gas above 0.1% leads to an increase in the rate of photosynthesis. ()
- 23- Increasing the light intensity leads to an increase in the rate of photosynthesis until it stabilizes at a certain limit. ()
- 24- Vertical farming helps us to solve the problem of the lack of arable land. ()
- 25- Plants have a specialized respiratory system. ()
- 26- The clear limewater solution turns milky in the absence of carbon dioxide gas. ()
- 27- Sodium hydroxide solution absorbs carbon dioxide gas from the surrounding medium. ()
- 28- Both chloroplasts and mitochondria are surrounded by double membranes. ()
- 29- Cristae of mitochondria are flat to increase energy production. ()
- 30- The matrix of the mitochondrion is solid and contains enzymes. ()
- 31- Fluid-filled spaces are found in both chloroplasts and mitochondria. ()
- 32- Cellular respiration occurs in the cytoplasm of living cells and mitochondria organelles. ()
- 33- In the cellular respiration process, catabolism of glucose molecules occurs. ()
- 34- A limited amount of energy is produced in the second stage of cellular respiration process. ()
- 35- In the process of cellular respiration, each glucose molecule is consumed, forming one molecule of CO₂ and six molecules of H₂O. ()
- 36- The formation of ATP molecules from ADP molecules represents catabolism. ()

6) Correct the underlined words:

- 1- Van Helmont's experiment on a willow sapling takes 5 days.
- 2- In photosynthesis, water and mineral salts are transported from the roots to the rest of the plant through the phloem tissue.
- 3- Plants absorb light energy from the sun through chlorophyll found in mitochondria.
- 4- The chloroplast is surrounded by a single membrane.
- 5- In chloroplasts, stroma is formed from 15 or more thylakoids.
- 6- The stroma membranes contain different types of pigments.
- 7- The roots of sweet potatoes and stems of potatoes contain chromoplasts.
- 8- Hormones are protein molecules that increase the rate of speed of light independent reactions in plants.
- 9- In light dependent reactions, part of the energy of the active chlorophyll is used to decompose water into nitrogen and hydrogen.
- 10- The atoms of sulphur, hydrogen, and oxygen are rearranged in photosynthesis.
- 11- ATP molecule contains two units of adenine and one unit of ribose sugar.
- 12- ADP molecule has less mass than ATP molecule, by the mass of one adenine unit.
- 13- The number of water molecules reacting in photosynthesis is equal to the number of glucose molecules produced from it.
- 14- Glucose is stored in plants in the form of protein.
- 15- When iodine solution is added to a green plant leaf containing starch, it turns red.
- 16- Horizontal farming provides a sustainable solution to the lack of arable land problem.
- 17- Respiration is a gas exchange process that occurs only during the daytime in plants and green algae.
- 18- The colour of the limewater solution disappears in the absence of oxygen gas.

- 19- Mitochondria perform photosynthesis process.
- 20- Chloroplasts are considered power stations for producing energy.
- 21- The number of mitochondria organelles increases in the cells of stomach and muscle cells.
- 22- Pyruvic acid is broken down in the first stage of cellular respiration process.
- 23- The reactions of the Krebs cycle occur in the matrix of mitochondria to lactic acid.
- 24- In the first stage of cellular respiration process, each molecule of glucose is broken down into 6 molecules of pyruvic acid.
- 25- Gas exchange is the process that includes both anabolism and catabolism.
- 26- In metabolic processes, energy of ATP molecules is released in anabolic processes.
- 27- The breakdown of glucose is accompanied by absorbing energy.

7) Mention the difference between (compare):

- 1- Light dependent reactions and Light independent reactions in terms of (dependence on light, location, needs and products).
- 2- ATP molecules and ADP molecules.
- 3- Green plastids and mitochondria in terms of (shape, structure and importance).
- 4- The outer membrane and inner membrane of the mitochondria.
- 5- Reactions of the first and second stages of cellular respiration process in terms of (dependence on oxygen, location, reactions happen and amount of ATP molecules produced).
- 6- Catabolic processes and anabolic processes in terms of definition.

8) Give reason for:

1- Flower petals are colourful.

➤

2- The presence of enzymes in the stroma in the chloroplast.

➤

3- White light is considered a compound light.

➤

4- Plant leaves appear green.

➤

5- The stroma is considered a suitable site for completing light independent reactions.

➤

6- The importance of chlorophyll in photosynthesis process.

➤

7- Oxygen gas is found in large amounts in gardens during daylight.

➤

8- Glucose produced from photosynthesis is stored in plants in the form of starch.

(Many glucose molecules are linked together in long chains, forming starch granules.)

➤

9- Formation of a green solution when an amount of ethanol is added to pieces of spinach leaves.

➤

10- Immersing the plant leaves in ethanol before performing the test for starch.

➤

11- Low light affects the overall growth of the plant.

➤

12- Vertical farming is considered a solution to the problem of limited agricultural land.

➤

13- Clear limewater becomes milky inside a closed container with a green plant in a dark place.

➤

14- The mass of a soda lime sample changes when it is left with a green plant in a closed container in a dark place.

➤

15- Mitochondria are energy-producing powerhouses.

➤

16- The number of mitochondria increases inside liver and muscle cells.

➤

17- Inner membrane of mitochondria forms folds called cristae.

(The cristae of the mitochondria are zigzagged.)

➤

18- Cellular respiration in plants is complementary to photosynthesis.

➤

19- Cellular respiration stages do not occur effectively in the absence of oxygen.

➤

20- The stoppage of Krebs cycle reactions leads to the stoppage of the electron transport chain.

➤

21- Cellular respiration process represents a catabolic process.

(Cellular respiration is a breaking down process.)

➤

22- Photosynthesis process represents an anabolic process.

(Photosynthesis is a building process.)

➤

23- The difference between the anabolic rate and the catabolic rate in the childhood and old age.

➤

9) What are the results of (What happens...)?

1- Extension of the edges of some thylakoid discs in one granum to meet the edges of a disc in another granum.

➤

2- Removal of grana from the chloroplast.

➤

3- A stable atom gains a certain amount of energy.

➤

4- The electron in an excited atom losing the quantum of energy it gained.

➤

5- Chlorophyll molecules absorb energy from both red and blue light.

➤

6- Water molecules absorb a part of the energy of active chlorophyll.

➤

7- ADP molecules absorb a part of the energy of active chlorophyll.

(Adding a phosphate group to an adenosine diphosphate (ADP) molecule)

➤

8- The sunlight falling on the chlorophyll solution.

➤

9- Failure to store glucose in the form of starch.

➤

10- Adding drops of iodine solution to a green plant leaf that has been exposed to sunlight for several hours.

➤

11- Adding drops of iodine solution to a variegated leaf that has been exposed to sunlight for several hours..

➤

12- Cover a part of a plant leaf exposed to sunlight with a black tape.

➤

13- Increasing the concentration of CO₂ gas above 0.1%.

(according to the rate of photosynthesis)

➤

14- Increasing the temperature above 20°C.

(according to the rate of photosynthesis)

➤

15- Passing carbon dioxide gas through soda lime and sodium hydroxide solution.

➤

16- A plant is placed with a methylene blue solution under a transparent glass bell jar exposed to light.

➤

17- A plant was placed in a vacuumed glass bell jar for several days.

➤

18- Absence of mitochondria organelles.

➤

19- The outer membrane of the mitochondria is ruptured.

➤

20- The cristae of mitochondria were flat.

(Disappearance of cristae from the inner membrane of mitochondria.)

➤

21- The absence of oxygen gas from the two stages of cellular respiration process.

(Enzymes are removed from the mitochondrial matrix.)

(Stoppage of electron transport chain reactions inside mitochondria.)

➤

22- Decrease in the number of electrons involved in electron transport chain reactions in mitochondria.

➤

23- The reaction of pyruvic acid in the Krebs cycle.

➤

24- Glycogen molecules stored in the digestive process are broken down.

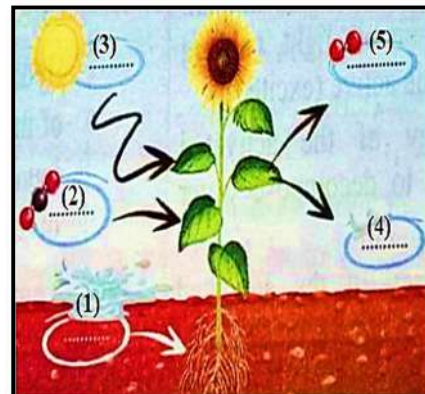
➤

10) State one importance for each of the following:

- 1- The double membrane in the chloroplast:**
.....
- 2- Stroma:**
.....
- 3- Thylakoid membranes:**
.....
- 4- Grana:**
.....
- 5- Triangular glass prism:**
.....
- 6- Stomata on leaves:**
.....
- 7- The outer membrane of mitochondria:**
.....
- 8- Matrix of mitochondria:**
.....
- 9- The Krebs cycle:**
.....
- 10- Electron transport chain reactions:**
.....
- 11- Metabolic analyzer device:**
.....

11) Study the following figures then answer:

1- The opposite figure represents Photosynthesis process. Complete:

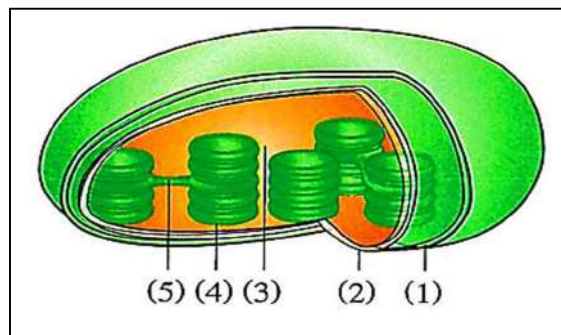


- Photosynthesis takes place in the..... found in the green parts of plants.
- The plant rearranges the atoms it has obtained, which are (1)molecules absorbed from the soil and (2) molecules absorbed from the air, in the presence of (3)to form its food (4) (.....sugar), and release (5)gas as a by-product.
- Manymolecules are linked together in long chains, forminggranules, which are in cold water.
- The factors affecting the rate of photosynthesis process are....., concentration of, and, in addition to water, mineral salts and wind.
- The balanced equation of the photosynthesis is:

.....

2- Study the following figures then answer:

- The opposite figure represents one of the cellular organelles in plant cells which is.....

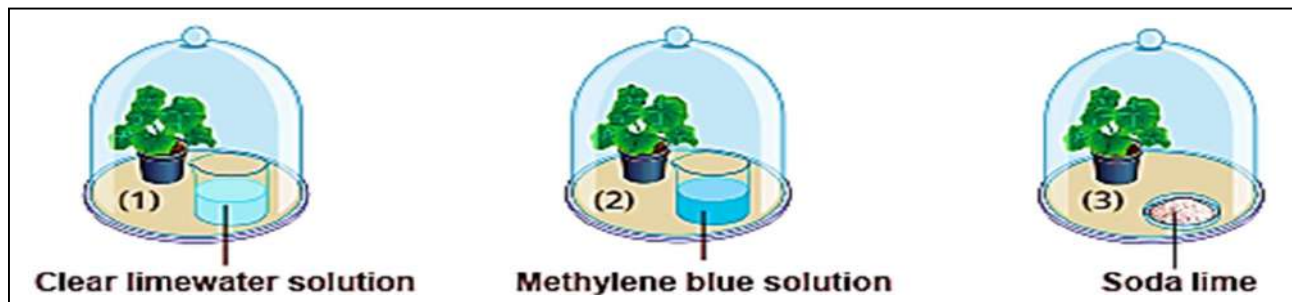


b) Label:

- (1) (2)
(3) (4) (5)

- Structure (4) consists of approximately 15or more.
- Water is decomposed in structure number
- Glucose and ADP molecules are produced in structure number

3- Study the following figures then complete:



- The disappearance of the blue colour of the methylene blue solution in figure (2) is evidence of the consumption ofgas.
- The turbidity of lime water in figure (1) is evidence of the formation ofgas produced fromprocess.
- Soda lime absorbs gas from the surrounding medium.

4- Study the following figures then answer:

- What is the name of this organelle?

➤

- What is the name of the biological Process that occurs in it? Write the balanced symbolic equation representing it.

➤

➤

- Label:

(1)

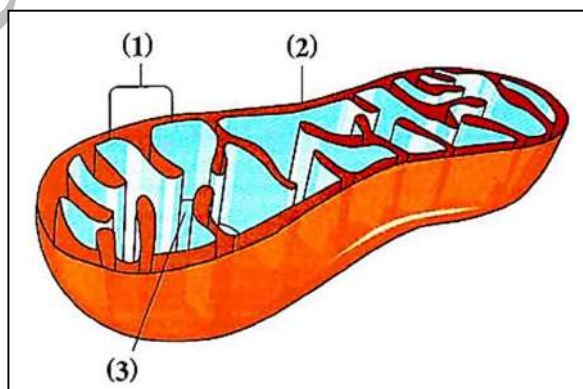
(2)

(3)

- What is the name of the reactions that occur in:

➤ region (1):

➤ region (3):



Prep 2 Final Revision on unit 3 (answered)

1) Choose the correct answer:

- 1-is considered the main factor in Van Helmont's experiment for growth of willow tree.
a) soil b) carbon dioxide c) water d) oxygen
- 2-responsible for light absorption in chloroplasts.
a) thylakoids b) stroma c) cell wall d) outer membrane
- 3- Opaque green objects.....the green light falling on them, while transparent green objects.....the same light.
a) transmit / reflect b) reflect / transmit
c) reflect / absorb d) absorb / reflect
- 4- Opaque red objects red light and the remaining spectrum colours that fall on them through it.
a) transmit / reflect b) reflect / transmit
c) reflect / absorb d) absorb / reflect
- 5- Glucose is formed in.....
a) thylakoids b) stroma c) grana d) outer membrane
- 6- The adenosine unit is linked to.....phosphate groups in ATP molecule.
a) one b) two c) three d) four
- 7- The light dependent reactions require the presence of all the following, except.....
a) sunlight. b) oxygen. c) water. d) chlorophyll.
- 8- The concentration of CO₂ gas at which the rate of photosynthesis is optimum is.....
a) 0.01% b) 0.1% c) 1% d) 10%
- 9- The temperature at which the rate of photosynthesis is optimum.....
a) 2 °C b) 10 °C c) 15 °C d) 20 °C
- 10- All the following substances are used to detect the presence of carbon dioxide gas, except.....
a) sodium hydroxide solution. b) soda lime.
c) methylene blue solution. d) clear limewater.

- 11- Gases exchange occurs in plant leaves through the.....
- a) stomata b) chlorophyll c) mitochondria d) stroma
- 12- The plant produces carbon dioxide gas in the process.
- a) photosynthesis b) respiration c) transpiration d) growth
- 13- Mitochondria carry out.....production.
- a) glucose b) protein c) energy d) fat
- 14- Mitochondria contain
- a) a folded outer membrane. b) a flat inner membrane.
- c) a fluid matrix called cristae . d) matrix containing enzymes.
- 15- The matrix of mitochondria is where..... reactions occur.
- a) glucose synthesis b) Krebs cycle
- c) electron transport chain d) glycolysis
- 16-reactions occur on the inner membrane of mitochondria.
- a) Photosynthesis b) Krebs cycle
- c) electron transport chain d) glycolysis
- 17- Krebs cycle reactions occur in the presence of.....gas.
- a) O₂ b) CO₂ c) H₂ d) N₂
- 18- In cellular respiration process, energy is released in form of..... molecules.
- a) glucose b) ATP c) ADP d) oxygen
- 19- All the following are produced from the second stage of cellular respiration process, except.....
- a) pyruvic acid. b) CO₂ gas.
- c) large amount of energy. d) electrons.
- 20- Limited amount of energy in the form of ATP molecules is formed in.....
- a) electron transport chain and Krebs cycle.
- b) glycolysis and Krebs cycle.
- c) glycolysis and electron transport chain
- d) electron transport chain only.

21- The hydrolysis of five glucose molecules in the cytoplasm of a living cell produces.....molecules of pyruvic acid.

- a) 2 b) 5 c) 6 d) 10

22- All the followings represent anabolic processes except.....

- a) Conversion of glucose into glycogen.
b) Conversion of proteins into amino acids.
c) Growth of muscle fibers.
d) Conversion of fatty acids into fats.

2) Complete the following statements:

- 1-** In the Helmont's experiment, the mass of the soil used was decreased slightly, while the tree mass was increased significantly.
- 2-** The process of converting light energy into chemical energy within plants is known as photosynthesis process.
- 3-** Plastids are classified into chloroplasts, chromoplasts and leucoplasts according to the pigments that make up them.
- 4-** The pigments responsible for the colour of chloroplasts are found in the thylakoid membranes.
- 5-** The herbaceous stems of mallow plant contain green plastids, while the petals of the flowers contain coloured plastids.
- 6-** Thylakoids are the structural units that make up grana.
- 7-** In green plastid, the edges of some thylakoids are connected to each other by thin membranes.
- 8-** Light dependent reactions take place in grana, while light independent reactions take place in stroma.
- 9-** In light dependent reactions, chlorophyll absorbs blue and red light energies from the visible light, to become excited.
- 10-** Energy of active chlorophyll is used in decomposition of water molecules and the formation of ATP molecules.
- 11-** Adenosine unit formed through the connection between an adenine unit and a ribose sugar unit.
- 12-** The molecule of ADP transforms to ATP by gaining a phosphate group.

- 13- The light independent reactions require the presence of hydrogen and carbon dioxide.
- 14- To form glucose, hydrogen combines with CO₂ gas in the presence of ATP molecules produced from light dependent reactions and enzymes present in the stroma.
- 15- In photosynthesis, six molecules of carbon dioxide are converted into only one molecule of glucose.
- 16- The efficiency of starch granule storage is high, as seen in the roots of sweet potato and stems of potato.
- 17- The working principle of vertical farming depends on the use of artificial lighting and hydroponics.
- 18- In plants, photosynthesis process occurs during the daytime only, while respiration process occurs during the day and the night.
- 19- The clear limewater solution is used to detect the presence of carbon dioxide.
- 20- Soda lime is a solid mixture of sodium hydroxide and calcium oxide.
- 21- In chloroplasts, thin membranes increase the surface area of the thylakoids exposed to light, while cristae increase the inner surface area of the mitochondria.
- 22- The first stage of cellular respiration takes place in the cytoplasm, while the second stage takes place in mitochondria.
- 23- The first stage of cellular respiration process occurs in absence of atmospheric oxygen.
- 24- Water is decomposed in the first stage of photosynthesis process, while glucose is decomposed in the first stage of cellular respiration process.
- 25- The Krebs cycle and electron transport chain reactions take place in the second stage of cellular respiration process.
- 26- The cellular respiration process on the inner membranes of the mitochondria produces water and ATP molecules.
- 27- Metabolism includes anabolic and catabolic processes.
- 28- In metabolic processes, energy of ATP molecules is consumed in anabolic processes.

- 29- Conversion of glucose to glycogen represents anabolic process, while Cellular respiration represents catabolic process.
- 30- Conversion of ADP molecules into ATP molecules represents anabolic process.
- 31- Converting glycogen molecules into glucose molecules during digestion represents catabolic process.
- 32- The anabolism of proteins from amino acids occurs in the cytoplasm.
- 33- Digestion (Catabolism) of proteins produces amino acids, while digestion of starch produces glucose.

3) Write the scientific term:

- 1- The process of making food and producing oxygen from sunlight, water, and carbon dioxide. (Photosynthesis)
- 2- Cell organelles found in the green parts of plants and green algae, where the process of photosynthesis occurs. (Chloroplasts)
- 3- Vessels that allow nutrients to move from the leaves to the rest of the plant parts. (Phloem)
- 4- Part of the chloroplast that is composed of structural units called discs. (Granum)
- 5- A type of pigment inside chloroplasts that gives plant leaves their green colour. (Chlorophyll)
- 6- The ground of the plastid (the matrix) contains the enzymes necessary for photosynthesis. (Stroma)
- 7- The reactions that occur in stroma, without the need for the presence of light. (Light independent reactions)
- 8- Energy molecules which are used in rearranging the atoms during photosynthesis. (ATP molecules)
- 9- Natural Openings in plant leaves through which they obtain atmospheric oxygen needed for respiration. (Stomata)
- 10- A vital process in which carbon dioxide and oxygen are exchanged with surrounding environment. (Gas exchange)

- 11- Specialized organelles that resemble beans and found in most the cells. (Mitochondria)
- 12- The membrane where reactions occur producing the largest amount of ATP molecules. (Inner mitochondrial membrane)
- 13- Organic molecule resulted from glycolysis in the cytoplasm. (Pyruvate)
- 14- A device used for effective exercise planning. (Metabolic analyzer)

4) What is meant by:

1- Stroma.

- The fluid-filled space in the chloroplasts surrounded by the inner membrane.

2- Excited atom.

- The atom in which the electron moves from its stable energy level to a higher energy level.

3- Light dependent reactions.

- Group of chemical reactions that occur in grana inside the chloroplast in the presence of light.

4- Vertical farming.

- Innovative technology in modern cities, which mimics the suitable conditions for farming to perform photosynthesis.

5- Cellular respiration process.

- It is the process of breaking down the large molecules of nutrients such as glucose inside the living cells in the presence of oxygen, to form smaller molecules of water and carbon dioxide gas, releasing a quantity of energy in the form of ATP molecules.

6- Metabolism.

- It is a series of chemical reactions that occur in the cells of a living organism to carry out all the vital processes necessary for survival.

5) Put (✓) or (x):

- 1- Scientists in ancient times believed that plants obtained their nutrients from the soil. (✓)
- 2- Van Helmont's experiment on a willow sapling demonstrated the importance of water in plant growth. (✓)
- 3- Photosynthesis occurs in the green parts of plants, especially in leaves and in green algae. (✓)
- 4- Chromoplasts are found in plum fruits. (✓)
- 5- Red transparent sheet absorbs red light. (x)
- 6- In photosynthesis, the plant uses carbon dioxide and glucose. (x)
- 7- The first stage of photosynthesis takes place in the presence of light and oxygen. (x)
- 8- The reactions of thylakoid membranes depend on the presence of light. (✓)
- 9- Grana contains the enzymes necessary for light independent reactions. (x)
- 10- The reactions of stroma in the chloroplast use water molecules. (x)
- 11- In the ball and stick model of photosynthesis, the balls represent the elements atoms, while the sticks represent the chemical bonds. (✓)
- 12- The molecule of ATP transforms to ADP by losing adenine. (x)
- 13- ATP molecule consists of an adenosine unit linked to two phosphate groups. (x)
- 14- Placing plant leaves in boiled water leads to the breaking of the cell wall. (✓)
- 15- Absorbing energy by the protons in the stable atom transforms it into an excited atom. (x)
- 16- Ethanol is used as a solvent in extracting chlorophyll from plant leaves. (✓)
- 17- The taro corm is rich in starch. (✓)
- 18- Water and mineral salts are factors that affect photosynthesis. (✓)
- 19- The mass of a starch unit is much less than the mass of a glucose unit. (x)

- 20- Starch can be stored in the leaves, roots and stems. (✓)
- 21- Raising the temperature above 20°C leads to an increase in the rate of photosynthesis. (x)
- 22- Increasing the concentration of CO₂ gas above 0.1% leads to an increase in the rate of photosynthesis. (x)
- 23- Increasing the light intensity leads to an increase in the rate of photosynthesis until it stabilizes at a certain limit. (✓)
- 24- Vertical farming helps us to solve the problem of the lack of arable land. (✓)
- 25- Plants have a specialized respiratory system. (x)
- 26- The clear limewater solution turns milky in the absence of carbon dioxide gas. (x)
- 27- Sodium hydroxide solution absorbs carbon dioxide gas from the surrounding medium. (✓)
- 28- Both chloroplasts and mitochondria are surrounded by double membranes. (✓)
- 29- Cristae of mitochondria are flat to increase energy production. (x)
- 30- The matrix of the mitochondrion is solid and contains enzymes. (x)
- 31- Fluid-filled spaces are found in both chloroplasts and mitochondria. (✓)
- 32- Cellular respiration occurs in the cytoplasm of living cells and mitochondria organelles. (✓)
- 33- In the cellular respiration process, catabolism of glucose molecules occurs. (✓)
- 34- A limited amount of energy is produced in the second stage of cellular respiration process. (x)
- 35- In the process of cellular respiration, each glucose molecule is consumed, forming one molecule of CO₂ and six molecules of H₂O. (x)
- 36- The formation of ATP molecules from ADP molecules represents catabolism. (x)

6) Correct the underlined words:

- 1- Van Helmont's experiment on a willow sapling takes 5 days. (5 years)
- 2- In photosynthesis, water and mineral salts are transported from the roots to the rest of the plant through the phloem tissue. (xylem)
- 3- Plants absorb light energy from the sun through chlorophyll found in mitochondria. (chloroplasts)
- 4- The chloroplast is surrounded by a single membrane. (double)
- 5- In chloroplasts, stroma is formed from 15 or more thylakoids. (granum)
- 6- The stroma membranes contain different types of pigments. (thylakoid)
- 7- The roots of sweet potatoes and stems of potatoes contain chromoplasts. (leucoplasts)
- 8- Hormones are protein molecules that increase the rate of speed of light independent reactions in plants. (Enzymes)
- 9- In light dependent reactions, part of the energy of the active chlorophyll is used to decompose water into nitrogen and hydrogen. (oxygen)
- 10- The atoms of sulphur, hydrogen, and oxygen are rearranged in photosynthesis. (carbon)
- 11- ATP molecule contains two units of adenine and one unit of ribose sugar. (one unit)
- 12- ADP molecule has less mass than ATP molecule, by the mass of one adenine unit. (phosphate group)
- 13- The number of water molecules reacting in photosynthesis is equal to the number of glucose molecules produced from it. (oxygen)
- 14- Glucose is stored in plants in the form of protein. (starch)
- 15- When iodine solution is added to a green plant leaf containing starch, it turns red. (dark blue)
- 16- Horizontal farming provides a sustainable solution to the lack of arable land problem. (Vertical)
- 17- Respiration is a gas exchange process that occurs only during the daytime in plants and green algae. (Photosynthesis)

- 18- The colour of the limewater solution disappears in the absence of oxygen gas. (methylene blue)
- 19- Mitochondria perform photosynthesis process. (cellular respiration)
- 20- Chloroplasts are considered power stations for producing energy. (Mitochondria)
- 21- The number of mitochondria organelles increases in the cells of stomach and muscle cells. (liver)
- 22- Pyruvic acid is broken down in the first stage of cellular respiration process. (Glucose)
- 23- The reactions of the Krebs cycle occur in the matrix of mitochondria to lactic acid. (pyruvic)
- 24- In the first stage of cellular respiration process, each molecule of glucose is broken down into 6 molecules of pyruvic acid. (2)
- 25- Gas exchange is the process that includes both anabolism and catabolism. (Metabolism)
- 26- In metabolic processes, energy of ATP molecules is released in anabolic processes. (catabolic)
- 27- The breakdown of glucose is accompanied by absorbing energy. (releasing)

7) Mention the difference between (compare):

- 1- Light dependent reactions and Light independent reactions in terms of (dependence on light, location, needs and products).

P.O.C.	Light dependent	Light independent
Light	Depend on light.	Don't depend on light.
Location	Grana	Stroma
Needs	Chlorophyll, sunlight, water and ADP molecules.	Hydrogen, carbon dioxide, ATP molecules and enzymes.
Products	Hydrogen, ATP molecules and Oxygen.	Glucose and ADP molecules.

2- ATP molecules and ADP molecules.

ATP molecules	ADP molecules
Contain ribose sugar, adenine, and 3 phosphate groups.	Contain ribose sugar, adenine, and 2 phosphate groups.
It converts into an ADP molecule when it loses a phosphate group.	It converts into an ATP molecule when it gains a phosphate group.
Produced from light dependent reactions.	Produced from light independent reactions.

3- Green plastids and mitochondria in terms of (shape, structure and importance).

P.O.C.	Green plastids	Mitochondria
Shape	It resembles lentil grain.	It resembles a bean.
Structure	Double membrane – Stroma – Grana.	Double membrane – Matrix.
Importance	Photosynthesis takes place in it.	Cellular respiration takes place in it.

4- The outer membrane and inner membrane of the mitochondria.

Outer membrane	Inner membrane
Flat membrane.	Forms folds called cristae.
It protects the components of the mitochondrion and regulates the entry and exit of substances.	It increases the internal surface area where the electron transport chain reactions occur to produce more energy with high efficiency.

5- Reactions of the first and second stages of cellular respiration process in terms of (dependence on oxygen, location, reactions happen and amount of ATP molecules produced).

P.O.C.	First stage	Second stage
Oxygen	It occurs in the absence of atmospheric oxygen.	It occurs in the presence of atmospheric oxygen.
Location	Cytoplasm	Inside the mitochondria
Reactions	Glycolysis	Krebs cycle and electron transport chain reactions
ATP produced	Limited amount	Large quantity of energy

6- Catabolic processes and anabolic processes in terms of definition.

Catabolic processes	Anabolic processes
Processes in which the energy of ATP molecules is released by breaking down a large molecule into simpler molecules.	Processes in which the energy of ATP molecules is consumed in building a large, complex molecule from many simple molecules.

8) Give reason for:

1- Flower petals are colourful.

- Due to the presence of chromoplasts (coloured plastids).

2- The presence of enzymes in the stroma in the chloroplast.

- To increase the rate of light independent reactions without requiring high temperatures.

3- White light is considered a compound light.

- Because it consists of 7 visible spectrum colors.

4- Plant leaves appear green.

- Because the chlorophyll inside leaves reflects green light and absorb the other colours of the spectrum.

5- The stroma is considered a suitable site for completing light independent reactions.

- Because it contains most of the enzymes needed for these reactions.

6- The importance of chlorophyll in photosynthesis process.

- Because the chlorophyll absorbs blue and red light energies from the visible light necessary for the light dependent reactions.

7- Oxygen gas is found in large amounts in gardens during daylight.

- Because it is produced from light dependent reactions in photosynthesis as a by-product.

8- Glucose produced from photosynthesis is stored in plants in the form of starch.

(Many glucose molecules are linked together in long chains, forming starch granules.)

- Because glucose dissolves in cold water, while starch is sparingly soluble in cold water, so glucose molecules are stored in the form of starch to prevent it from dissolving in the plant sap.

9- Formation of a green solution when an amount of ethanol is added to pieces of spinach leaves.

- Because ethanol extracts chlorophyll from spinach leaves, causing the liquid to turn green.

10- Immersing the plant leaves in ethanol before performing the test for starch.

- To remove the green chlorophyll colour, so that its colour doesn't interfere with the colour that will be formed later upon the addition of iodine solution.

11- Low light affects the overall growth of the plant.

- Because it affects the light dependent reactions, which in turn impacts the light independent reactions, so the production of glucose (the plant food) decreases, Which affects the overall growth of the plant.

12- Vertical farming is considered a solution to the problem of limited agricultural land.

- Because it mimics the suitable conditions for farming to perform photosynthesis in multi-storey buildings for the production of vegetables and fruits using artificial lighting and hydroponics.

13- Clear limewater becomes milky inside a closed container with a green plant in a dark place.

- Due to abundance of carbon dioxide gas produced from respiration process.

14- The mass of a soda lime sample changes when it is left with a green plant in a closed container in a dark place.

- Due to absorption of carbon dioxide gas produced from respiration process.

15- Mitochondria are energy-producing powerhouses.

- Because most cellular respiration process occurs in the mitochondria that produces energy from nutrients.

16- The number of mitochondria increases inside liver and muscle cells.

- Because they require a large amount of energy.

17- Inner membrane of mitochondria forms folds called cristae.

(The cristae of the mitochondria are zigzagged.)

- To increase the internal surface area of the mitochondrion, allowing more energy to be produced with high efficiency.

18- Cellular respiration in plants is complementary to photosynthesis.

- Because the glucose formed during photosynthesis is broken down in cellular respiration process.

19- Cellular respiration stages do not occur effectively in the absence of oxygen.

- Because the reactions of the second stage occur in the presence of atmospheric oxygen.

20- The stoppage of Krebs cycle reactions leads to the stoppage of the electron transport chain.

- Because the reactions of electron transport chain involve the electrons which are produced from the Krebs cycle.

21- Cellular respiration process represents a catabolic process.

(Cellular respiration is a breaking down process.)

- Because it involves breaking down of large molecules (glucose) into simpler molecules (water and carbon dioxide gas), with releasing energy in the form of ATP molecules.

22- Photosynthesis process represents an anabolic process.

(Photosynthesis is a building process.)

- Because it involves consuming the energy of ATP molecules in building a large complex molecule (glucose) from many simple molecules (water and carbon dioxide gas).

23- The difference between the anabolic rate and the catabolic rate in the childhood and old age.

- Because the anabolic rate is greater than the catabolic rate in the childhood, while the catabolic rate is greater than the anabolic rate in the old age.

9) What are the results of (What happens...)?

- 1- Extension of the edges of some thylakoid discs in one granum to meet the edges of a disc in another granum.**
 - It increases the surface area of the thylakoid membrane that is exposed to light.
- 2- Removal of grana from the chloroplast.**
 - The light dependent reactions will not take place.
- 3- A stable atom gains a certain amount of energy.**
 - Its electrons move to a higher energy level, and it becomes an excited atom.
- 4- The electron in an excited atom losing the quantum of energy it gained.**
 - It quickly returns to its original energy level and the atom becomes stable once again.
- 5- Chlorophyll molecules absorb energy from both red and blue light.**
 - They are converted into active (excited) chlorophyll molecules.
- 6- Water molecules absorb a part of the energy of active chlorophyll.**
 - Water decomposes into hydrogen and oxygen.
- 7- ADP molecules absorb a part of the energy of active chlorophyll.**
(Adding a phosphate group to an adenosine diphosphate (ADP) molecule)
 - Each molecule binds with a phosphate group and is converted into ATP molecules.
- 8- The sunlight falling on the chlorophyll solution.**
 - The chlorophyll solution transmits green light and absorbs the remaining colours of the spectrum, so the chlorophyll solution appears green.
- 9- Failure to store glucose in the form of starch.**
 - Glucose molecules will dissolve in the plant sap.
- 10- Adding drops of iodine solution to a green plant leaf that has been exposed to sunlight for several hours.**
 - The iodine solution turns into dark blue due to the presence of starch.
- 11- Adding drops of iodine solution to a variegated leaf that has been exposed to sunlight for several hours..**

- The colour of the iodine solution changes to dark blue in the green areas only of the leaf.

12- Cover a part of a plant leaf exposed to sunlight with a black tape.

- The covered part can't make photosynthesis and starch will not form.

13- Increasing the concentration of CO₂ gas above 0.1%.

(according to the rate of photosynthesis)

- The rate of photosynthesis remains constant, without increase.

14- Increasing the temperature above 20°C.

(according to the rate of photosynthesis)

- The rate of photosynthesis gradually decreases until it stops.

15- Passing carbon dioxide gas through soda lime and sodium hydroxide solution.

- The mass of soda lime and sodium hydroxide solution will change due to absorption of carbon dioxide gas.

16- A plant is placed with a methylene blue solution under a transparent glass bell jar exposed to light.

- No change occurs in the colour of the methylene blue solution, due to abundance of oxygen gas produced from photosynthesis process.

17- A plant was placed in a vacuumed glass bell jar for several days.

- Stopping photosynthesis and respiration processes so the plant will die.

18- Absence of mitochondria organelles.

- Cells can't produce energy needed for vital processes.

19- The outer membrane of the mitochondria is ruptured.

- The mitochondrion can't regulate the entry and exit of substances.

20- The cristae of mitochondria were flat.

(Disappearance of cristae from the inner membrane of mitochondria.)

- The internal surface area of the mitochondrion decreases, so amount of energy produced also decreases.

21- The absence of oxygen gas from the two stages of cellular respiration process.

(Enzymes are removed from the mitochondrial matrix.)

(Stoppage of electron transport chain reactions inside mitochondria.)

➤ The reactions of the second stage will not occur, and energy will not be produced.

22- Decrease in the number of electrons involved in electron transport chain reactions in mitochondria.

➤ The amount of energy produced in the form of ATP molecules decreases.

23- The reaction of pyruvic acid in the Krebs cycle.

➤ Pyruvic acid is broken down producing limited amount of energy in the form of ATP molecules, carbon dioxide gas and electrons.

24- Glycogen molecules stored in the digestive process are broken down.

➤ Glucose molecules are formed.

10) State one importance for each of the following:

1- The double membrane in the chloroplast: It allows substances to move in and out of the plastid.

2- Stroma: contains most of the enzymes needed for the light independent reactions.

3- Thylakoid membranes: contain several types of pigments, including green chlorophyll which is responsible for absorbing the light energy required for photosynthesis.

4- Grana: the part of chloroplast at which light dependent reactions take place.

5- Triangular glass prism: is used to split the white light into the 7 visible spectrum colors.

6- Stomata on leaves: Natural openings through which gas exchange process occurs in the plant.

7- The outer membrane of mitochondria: protects the components of the mitochondrion and regulates the entry and exit of substances.

8- Matrix of mitochondria: contains the enzymes used to catalyze the reactions of the Krebs cycle that take place inside it.

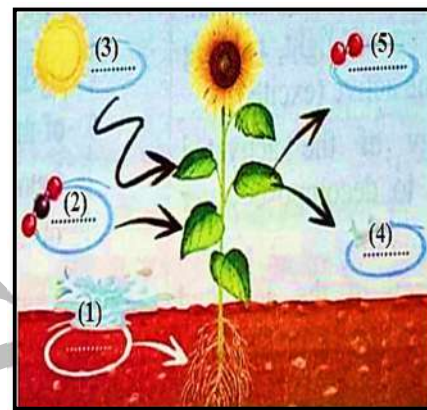
9- The Krebs cycle: chemical reactions in which pyruvic acid is broken down to produce limited amount of energy in the form of ATP molecules, carbon dioxide gas and electrons.

10- Electron transport chain reactions: Production of water and a large amount of energy in the form of ATP molecules.

11- Metabolic analyzer device: provides accurate data about the metabolic rate during rest and helps in effective planning of diet and exercise.

11) Study the following figures then answer:

1- The opposite figure represents Photosynthesis process. Complete:



- Photosynthesis takes place in the chloroplasts found in the green parts of plants.
- The plant rearranges the atoms it has obtained, which are (1) water molecules absorbed from the soil and (2) carbon dioxide molecules absorbed from the air, in the presence of (3) sunlight to form its food (4) (glucose sugar), and release (5) oxygen gas as a by-product.
- Many glucose molecules are linked together in long chains, forming starch granules, which are sparingly soluble in cold water.
- The factors affecting the rate of photosynthesis process are temperature, concentration of carbon dioxide gas, and light intensity, in addition to water, mineral salts and wind.
- The balanced equation of the photosynthesis is

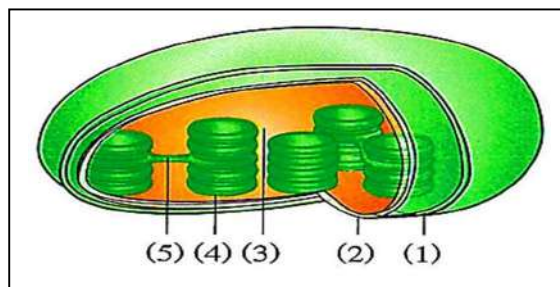


2- Study the following figures then answer:

- The opposite figure represents one of the cellular organelles in plant cells which is the green plastid (chloroplast).

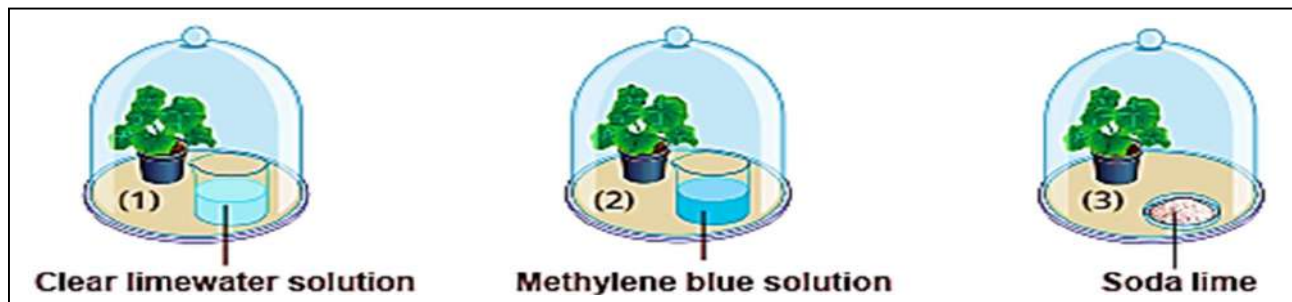
b) Label:

- outer membrane.
- inner membrane.
- stroma.
- grana.
- thin membrane.



- Structure (4) consists of approximately 15 thylakoids or more.
- Water is decomposed in structure number (4).
- Glucose and ADP molecules are produced in structure number (3).

3- Study the following figures then complete:



- The disappearance of the blue colour of the methylene blue solution in figure (2) is evidence of the consumption of oxygen gas.
- The turbidity of lime water in figure (1) is evidence of the formation of carbon dioxide gas produced from respiration process.
- Soda lime absorbs carbon dioxide gas from the surrounding medium.

4- Study the following figures then answer:

- What is the name of this organelle?

➤ Mitochondria.

- What is the name of the biological Process that occurs in it? Write the balanced symbolic equation representing it.

➤ Cellular respiration.

➤ $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP \text{ energy}$

- Label:

(1) inner membrane (cristae).

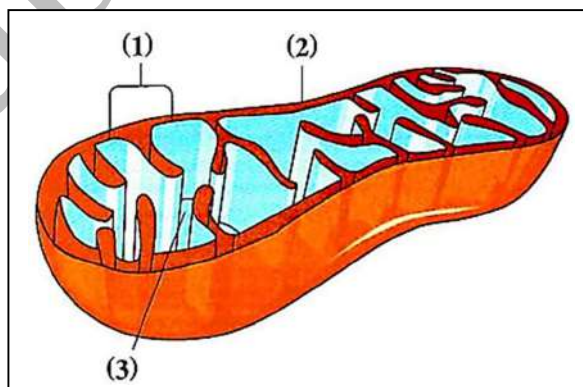
(2) outer membrane.

(3) matrix.

- What is the name of the reactions that occur in:

➤ region (1): electron transport chain reactions.

➤ region (3): Krebs cycle.



Prep 2 Final Revision on unit 4

1) Choose the correct answer:

- 1- The scientist assumed that Earth was one single continent 200 million years ago.
a) Van Helmont b) Alfred Wegener c) Moseley d) Newton
- 2- The rocky shell which is composed of Earth's crust and the solid part of the upper mantle is.....
a) lithosphere b) asthenosphere c) Earth's core d) geosphere
- 3- The asthenosphere is a part of.....
a) Earth's crust. b) the outer core.
c) the upper mantle. d) the inner core.
- 4- Among the slow geological movements inside Earth are.....
a) convergence of tectonic plates. b) volcanic eruptions.
c) earthquakes. d) weathering of rocks.
- 5- The..... movement leads to the formation of a new oceanic crust or continental crust.
a) divergent b) convergent c) transform d) parallel
- 6- When a divergent movement occurs between continental plates, it forms.....
a) long fault lines. b) volcanic islands. c) mountain ranges. d) rifts.
- 7- The formation of volcanic islands is due to the..... movement of tectonic plates.
a) divergent b) convergent c) transform d) constructive
- 8- The Japanese islands were formed from the convergence of.....
a) two continental plates. b) two oceanic plates.
c) an oceanic plate with a continental plate. d) all the previous.
- 9-mountains in Saudi Arabia are a volcanic mountain range.
a) Al-Mokattam b) Himalayas c) Andes d) Harrat Rahat
- 10-are rapid successive natural tremors occur in Earth's crust.
a) Volcanic eruptions. b) The aurora borealis.
c) Meteorites. d) Earthquakes.

- 11-** San Andreas Fault in America is caused by.....
- a) divergent plate movement.
 - b) convergence of two continental plates.
 - c) convergence of two oceanic plates.
 - d) transform movement of plates.
- 12-** Earthquakes cause all the following, except.....
- a) submergence of some islands.
 - b) Earth crack.
 - c) change in the courses of rivers.
 - d) tsunamis.
- 13-** The Hawaiian islands were formed as a result of.....
- a) volcanic eruptions.
 - b) the aurora borealis.
 - c) meteorites.
 - d) earthquakes.
- 14-** The Arizona crater in the USA is caused by.....
- a) the fall of a meteorite.
 - b) a tectonic earthquake.
 - c) a volcanic eruption.
 - d) a volcanic earthquake.
- 15-** All the following are natural phenomena that cause changes in Earth's surface, except.....
- a) volcanic eruptions.
 - b) the aurora borealis.
 - c) meteorites.
 - d) earthquakes.
- 16-** The fall of meteorites lead to all the following, except.....
- a) the extinction of the dinosaurs.
 - b) the formation of Harrat Rahat mountains.
 - c) the formation of Arizona crater.
 - d) the formation of Mount Kamel crater.
- 17-** All the following causes mechanical weathering of rocks, except.....
- a) acid rains.
 - b) winds.
 - c) running water.
 - d) temperature.
- 18-** All the following are minerals, except.....
- a) sulphur.
 - b) hematite.
 - c) opal.
 - d) halite.
- 19-** Sodium chloride occurs naturally in the form of the mineral.
- a) quartz.
 - b) hematite
 - c) opal
 - d) halite
- 20-** All the following are properties of minerals, except
- a) fragility.
 - b) colour.
 - c) transparency.
 - d) luster.

2) Complete the following statements:

- 1- The modern development of the continental drift hypothesis is called the theory of**
- 2- The Earth's crust divided into thecrust covered by water and thecrust covered by land.**
- 3- Theconsists of several separate solid plates of different shapes and sizes known asplates.**
- 4- Tectonic plates are divided intoplates and plates.**
- 5- The continental plates consist of continentaland a part of the solid upper**
- 6- Oceanic crust hasdensity, andthickness than that of the continental crust.**
- 7- Tectonic plates move in a slow and continuous movement over a layer called theas a result of the movement of the in the upper mantle**
- 8- When convergent movement of tectonic plates occurs, plate subducts underplate.**
- 9- The movement of the tectonic plates away from each other is calledmovement, while the movement of the tectonic plates towards each other is calledmovement.**
- 10- The divergent movement is caused byconvection currents, while the convergent movement is caused by convection currents.**
- 11- is the largest rift in the world, formed by the divergent movement of twoplates.**
- 12-mountain ranges were formed from the convergence of two continental plates, whilemountain ranges were formed from the convergence of a continental plate with an oceanic plate.**
- 13- The peaks of the Himalayan mountain range arethan the peaks of the Andes mountain range.**
- 14-movements lead to the formation of long faults.**

- 15- Scientists predict that theSea will turn in the future into a mountainous continental region.
- 16- Strong earthquakes lead to the occurrence of, which change the shape of
- 17-lead to the formation of flat plains, while lead to the emergence of islands and coasts.
- 18- It is assumed that the fall ofwas the cause of the extinction of the dinosaurs.
- 19- Thesystem is an advanced radar system that protects Earth from the dangers of meteorites.
- 20- Among theweathering methods are the wind,..... and
- 21-is the process of transporting rock fragments resulting from weathering away from the areas where they were originally found.
- 22- Red iron oxide occurs naturally in the form of themineral.
- 23- The colour of quartz changes depending on the type of present in it.
- 24- Minerals are classified according to theirinto ,and opaque minerals.
- 25-is a transparent mineral rich in silicates, while is a translucent mineral rich in silicates.
- 26- Among the methods of minerals formation areof magma andof solutions from hydrothermal
- 27- The minerals rich inand iron elements are olivine and
- 28-are cracks on the ocean floor from which the ocean hot water rich inrises as a result ofmovement.
- 29- Among the minerals formed by crystallization areand
- 30- Soil is classified depending on the way it was formed into soil andsoil.
- 31- The soil transported from one place to another by rivers is called soil.

- 32-soil has formed from the transportation of rock fragments from theto Egypt.
- 33- The soil that has formed and remained in the same location is known assoil.
- 34- Mariout soil andsoil aresoils in Egypt that both formed by the weathering and decomposition of androcks.
- 35- Among the forms of renewable energy areenergy,energy and hydroelectric energy.
- 36- Theof non-renewable natural resources requires their preservation from depletion and finding newfor them.

3) Write the scientific term:

- 1- A scientific hypothesis proposed that Earth was once a single massive continent.
- 2- A single massive continent that Wegener assumed to be found 200 million years ago.
- 3- The plates that make up Earth's lithosphere.
- 4- The plates located beneath the oceans.
- 5- They are the areas where the plates diverge.
- 6- The movement of tectonic plates sliding parallel to each other.
- 7- The advanced radar system that changes the orbit of meteorites.
- 8- The process of breaking and fragmenting the rocks through mechanical or chemical methods.
- 9- Shiny mineral that was used by the ancient Egyptians in the production of kohl.
- 10- The ability of a material to allow light to pass through it.
- 11- The solution that can't accept more of the solute at the same temperature.
- 12- The formation of crystals from a supersaturated solution upon cooling.

13- The surface layer of Earth's crust.

14- The decomposed organic matter found in the soil.

15- The resources that cannot be replenished once consumed.

4) What is meant by:

1- Asthenosphere.

➤

2- Transform boundaries.

➤

3- Volcanoes.

➤

4- Meteorites.

➤

5- Minerals.

➤

6- Solution.

➤

7- The Soil.

➤

8- Residual sedentary soil.

➤

5) Put (√) or (x):

1- The scientist Wegener proposed the theory of tectonic plates. ()

2- Earth's lithosphere is composed of several plates of different sizes and shapes. ()

3- The continental plates are composed of oceanic crust. ()

4- The Red Sea may turn into an ocean in the future. ()

5- Divergent boundaries are the boundaries at which the tectonic plates converge. ()

6- The Andes mountain range is higher than the Himalayas. ()

- 7- When an oceanic plate diverges from a continental plate, the oceanic plate subducts beneath the continental plate. ()
- 8- Tectonic earthquakes occur at the convergent, divergent and transform boundaries. ()
- 9- Earthquakes are similar in origin and intensity. ()
- 10- The tsunamis often occur due to strong earthquakes. ()
- 11- Volcanoes form flat plains and plateaus. ()
- 12- The pattern of an earthquake differs from the pattern of a volcano. ()
- 13- The geological processes lead to the formation of minerals. ()
- 14- The chemical weathering occurs when roots grow inside rock crevices. ()
- 15- Minerals are made up of rocks. ()
- 16- Minerals exist in the form of organic elements or compounds. ()
- 17- Minerals can be distinguished based on their transparency and luster. ()
- 18- The presence of impurities in the mineral gives it multiple colours. ()
- 19- Opal is a mineraloid that has a defined crystalline structure. ()
- 20- Quartz is an opaque mineral. ()
- 21- Magma may be rich in silica, magnesium and iron. ()
- 22- Silica is the basic chemical substance that makes up the magma which forms mica. ()
- 23- Quartz is among the minerals with definite (fixed) colors. ()
- 24- Mature soil contains water, air, clay, silt, gravel, sand and humus. ()
- 25- Most Egyptian soil is of the transported type. ()
- 26- River soil is one of the types of sedentary soil. ()
- 27- Mariout soil and Oasis soil have the same origin. ()
- 28- Oasis soil has formed in a place far from where it has been broken. ()
- 29- Non-renewable resources such as minerals and oil can be obtained from all Earth's spheres. ()
- 30- Mining minerals is more preferred rather than recycling them. ()

6) Correct the underlined words:

- 1- 135 million years ago, the continents of Asia and South America started to separate from each other.
- 2- The tectonic plates move rapidly above the asthenosphere.
- 3- The oceanic plates are composed of continental crust.
- 4- Convection currents occur beneath the tectonic plates in the outer core.
- 5- There are four types of plate tectonic movement.
- 6- Convection currents cause the divergent and transform movements of the tectonic plates.
- 7- The formation of the Red Sea is due to the convergent movement of tectonic plates.
- 8- The Mediterranean Sea contains an abundance of red algae.
- 9- The most common earthquakes are structural earthquakes.
- 10- Volcanoes cause landslides or landslips.
- 11- Volcanoes occur at the convergent and transform boundaries only.
- 12- Earthquakes are natural phenomena that cause changes in the course of rivers.
- 13- Rock masses that penetrate the atmosphere and fall to Earth are called lava.
- 14- The DART radar system is designed to determine the orbits of meteorites.
- 15- Table sugar is extracted from the mineral halite.
- 16- Sulphur mineral is red in colour.
- 17- Quartz is a transparent metal that may occur in a pink form.
- 18- Talc is a transparent mineral.
- 19- Magnesium-rich magma forms quartz when it solidifies.
- 20- The temperature of the water near magma chamber can reach 1000°C.
- 21- Hydrothermal vents are formed near the active earthquakes zones.
- 22- Solidification is the method of mineral formation from solutions in hydrothermal vents.

- 23- Apatite is a mineral formed by magma solidification.
- 24- Crystals can be formed from the unsaturated solution of sodium acetate.
- 25- Transported soil has the same chemical composition of the rocks above it.
- 26- The type of Oasis soil is river-sedentary.
- 27- Industry is the extraction of natural resources from the Earth.
- 28- Extracting minerals is the reuse of minerals instead of new mining.

7) Mention the difference between (compare):

- 1- Divergent movement and convergent movement in terms of definition.
- 2- The Himalayan mountain range and the Andes mountain range in terms of (Way of formation – Elevation – Geographical extension).
- 3- Earthquakes and Volcanoes in terms of (Definition – origin – Effect on Earth's surface – The resulting losses).
- 4- Unsaturated solution and supersaturated solution.
- 5- Calcite and pyroxene in terms of origin.
- 6- The soil of the Nile Delta and the soil of Mariout.

8) Give an example for:

- 1- Material loss caused by earthquakes.
- 2- Environmental loss caused by volcanoes.
- 3- Massive crater in Egypt.
- 4- Massive crater in USA.
- 5- Element mineral.
- 6- Compound mineral.
- 7- Shiny (luster) mineral.
- 8- Iron-rich mineral.
- 9- Silica-rich mineral.
- 10- Residual sedentary soil.

9) Give reason for:

1- Some rocks on the west coast of Africa and the east coast of South America contain similar remains of ancient organisms.

➤

2- Movement of tectonic plates.

➤

3- The divergence of tectonic plates from each other.

➤

4- The convergence of the tectonic plates towards each other.

➤

5- Subduction of oceanic plates beneath continental plates.

➤

6- The formation of the Himalayan mountain range.

➤

7- The formation of the African Great Rift Valley.

➤

8- The Andes Mountains are longer than the Himalayas.

➤

9- The probability of the Red Sea turning into an ocean.

(The probability of the Mediterranean Sea transforming into a mountainous continental region.)

➤

10- Formation of new volcanic island chains, such as the formation of the Japanese islands.

➤

11- Occurrence of the San Andreas Fault.

➤

12- The occurrence of tectonic earthquakes.

➤

13- Tsunamis occur on coasts.

➤

14- The occurrence of volcanoes.

➤

15- The pattern of earthquakes is similar to the pattern of volcanoes.

➤

16- Volcanoes change the features of the Earth's surface.

➤

17- The extinction of dinosaurs in ancient times before the existence of human.

(Formation of the crater of Mount Kamel in the Western Desert.)

(Formation of Arizona crater in the United States.)

➤

18- The DART radar system protects Earth from dangers.

➤

19- There are many forms of minerals.

➤

20- Oil is not considered a mineral.

➤

21- Plants play an effective role in the weathering of rocks.

➤

22- Erosion process is related to the weathering process.

➤

23- Sulphur mineral can be distinguished from hematite mineral by its colour.

➤

24- Carbohydrates and table sugar (**glucose**) are not considered a mineral.

➤

25- Minerals differ from each other in terms of transparency.

➤

26- Opal is not classified as a mineral.

➤

27- The use of some minerals by the ancient Egyptians.

➤

28- Talc mineral is considered opaque mineral.

➤

29- Mica is classified as a translucent (**semi-transparent**) mineral.

➤

30- The diversity of minerals formed from the solidification of magma.

➤

31- The properties of transported soil differ from Sedentary soil.

➤

32- The chemical composition of Nile Delta soil (**or transported soil**) differs from the composition of the original rocks beneath it.

➤

33- Minerals and fossil fuels are considered non-renewable resources.

➤

34- The increases in consumption of non-renewable resources.

➤

10) What are the results of (What happens...)?

1- The movement of the convection currents in the upper mantle.

➤

2- The movement of the tectonic plates.

➤

3- The movement of upward convection currents.

➤

4- The movement of downward convection currents.

➤

5- The movement of the divergent plates.

(**The divergence of two continental plates.**)

➤

6- The convergence of two continental plates.

➤

7- The convergence of two oceanic plates.

➤

8- The convergence of an oceanic plate with a continental plate.

➤

9- Tectonic plates moving side by side in opposite directions.

➤

10- The transform movement of tectonic plates.

➤

11- The release of the energy stored in rocks when they break.

➤

12- Rocks are not being exposed to any type of weathering.

➤

13- The presence of impurities in quartz mineral.

➤

14- The light falls on pure quartz mineral.

➤

15- Dripping a supersaturated solution of sodium acetate into the cold solid salt of the same compound.

➤

16- Contact between hydrothermal vent solutions with oceans water.

➤

17- Slow weathering of sandy and limestone rocks in the same place.

➤

18- Increased human activities in the fields of mining and oil.

(The control of the non-renewable resources by the major mining companies in the developed countries through the agreements.)

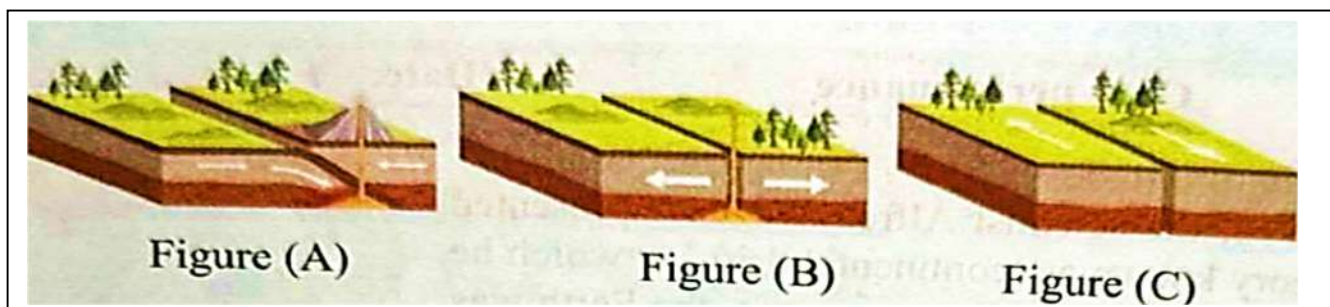
➤

19- Recycling minerals.

➤

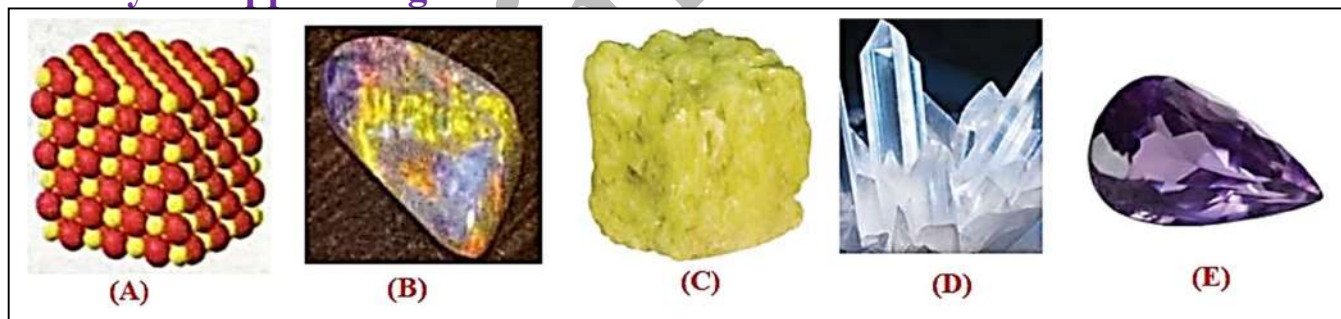
11) Study the following figures then answer:

1- The opposite figure shows the types of tectonic plates movements:



- a) Figure (A) represents themovement of tectonic plates that resulted in the formation ofranges such as thein Asia.
- b) Figure (B) represents themovement of tectonic plates that caused byconvection currents.
- c) Figure (C) represents themovement of tectonic plates in which the tectonic plates moveto each other.

2- Study the opposite figure then answer:



- a) The opposite figure shows different minerals, except figure which is not considered a mineral but considered as a
- b) Figure represents element mineral, while figure represents table salt crystal which is compound mineral known as
- c) What causes the colour of mineral (D) changes into (E).
-
- d) Minerals and oil are examples of non-renewable resources. Suggest some solutions to achieve their sustainability and reduce their depletion.
-

Prep 2 Final Revision on unit 4 (answered)

1) Choose the correct answer:

- 1- The scientist assumed that Earth was one single continent 200 million years ago.
a) Van Helmont b) Alfred Wegener c) Moseley d) Newton
- 2- The rocky shell which is composed of Earth's crust and the solid part of the upper mantle is.....
a) lithosphere b) asthenosphere c) Earth's core d) geosphere
- 3- The asthenosphere is a part of.....
a) Earth's crust. b) the outer core.
c) the upper mantle. d) the inner core.
- 4- Among the slow geological movements inside Earth are.....
a) convergence of tectonic plates. b) volcanic eruptions.
c) earthquakes. d) weathering of rocks.
- 5- The..... movement leads to the formation of a new oceanic crust or continental crust.
a) divergent b) convergent c) transform d) parallel
- 6- When a divergent movement occurs between continental plates, it forms.....
a) long fault lines. b) volcanic islands. c) mountain ranges. d) rifts.
- 7- The formation of volcanic islands is due to the..... movement of tectonic plates.
a) divergent b) convergent c) transform d) constructive
- 8- The Japanese islands were formed from the convergence of.....
a) two continental plates. b) two oceanic plates.
c) an oceanic plate with a continental plate. d) all the previous.
- 9-mountains in Saudi Arabia are a volcanic mountain range.
a) Al-Mokattam b) Himalayas c) Andes d) Harrat Rahat
- 10-are rapid successive natural tremors occur in Earth's crust.
a) Volcanic eruptions. b) The aurora borealis.
c) Meteorites. d) Earthquakes.

- 11- San Andreas Fault in America is caused by.....
- divergent plate movement.
 - convergence of two continental plates.
 - convergence of two oceanic plates.
 - transform movement of plates.
- 12- Earthquakes cause all the following, except.....
- submergence of some islands.
 - Earth crack.
 - change in the courses of rivers.
 - tsunamis.
- 13- The Hawaiian islands were formed as a result of.....
- volcanic eruptions.
 - the aurora borealis.
 - meteorites.
 - earthquakes.
- 14- The Arizona crater in the USA is caused by.....
- the fall of a meteorite.
 - a tectonic earthquake.
 - a volcanic eruption.
 - a volcanic earthquake.
- 15- All the following are natural phenomena that cause changes in Earth's surface, except.....
- volcanic eruptions.
 - the aurora borealis.
 - meteorites.
 - earthquakes.
- 16- The fall of meteorites lead to all the following, except.....
- the extinction of the dinosaurs.
 - the formation of Harrat Rahat mountains.
 - the formation of Arizona crater.
 - the formation of Mount Kamel crater.
- 17- All the following causes mechanical weathering of rocks, except.....
- acid rains.
 - winds.
 - running water.
 - temperature.
- 18- All the following are minerals, except.....
- sulphur.
 - hematite.
 - opal.
 - halite.
- 19- Sodium chloride occurs naturally in the form of the mineral.
- quartz.
 - hematite
 - opal
 - halite
- 20- All the following are properties of minerals, except
- fragility.
 - colour.
 - transparency.
 - luster.

- 21- Mica mineral is similar to quartz mineral in
 a) method of formation. b) colour.
 c) ability to pass light. d) chemical composition.
- 22- Opal is described as.....
 a) metalloid. b) mineraloid. c) mineral. d) metal.
- 23-is the property which describes a mineral as opaque.
 a) Size b) Colour c) Transparency d) Luster
- 24- Mica is.....mineral.
 a) opaque b) translucent c) transparent d) colourless
- 25- The most widespread group of minerals in Earth's crust is.....
 a) carbonates. b) oxides. c) phosphates. d) silicates.
- 26- When silica-rich magma solidifies, it forms.....
 a) olivine. b) quartz. c) pyroxene. d) calcite.
- 27- The mineral pyroxene contains relatively high proportions of.....
 a) magnesium and iron. b) magnesium and copper.
 c) silica and iron. d) silica and sodium.
- 28- Hematite mineral is.....in color.
 a) violet b) yellow c) red d) black
- 29- The most common and important solvent is.....
 a) oil. b) water. c) alcohol. d) acid.
- 30- All the following are minerals formed by magma solidification, except.....
 a) olivine. b) quartz. c) pyroxene. d) calcite.
- 31- The non-renewable resources include.....
 a) winds and minerals. b) winds and oil.
 c) electric energy and solar energy. d) oil and minerals.
- 32- Non-renewable resources can be obtained from all Earth's spheres, except the.....
 a) hydrosphere. b) biosphere. c) geosphere. d) lithosphere.

2) Complete the following statements:

- 1- The modern development of the continental drift hypothesis is called the theory of tectonic plates.
- 2- The Earth's crust divided into the oceanic crust covered by water and the continental crust covered by land.
- 3- The lithosphere consists of several separate solid plates of different shapes and sizes known as tectonic plates.
- 4- Tectonic plates are divided into oceanic plates and continental plates.
- 5- The continental plates consist of continental crust and a part of the solid upper mantle.
- 6- Oceanic crust has higher density, and less thickness than that of the continental crust.
- 7- Tectonic plates move in a slow and continuous movement over a layer called the asthenosphere as a result of the movement of the convection currents in the upper mantle
- 8- When convergent movement of tectonic plates occurs, an oceanic plate subducts under a continental plate.
- 9- The movement of the tectonic plates away from each other is called divergent movement, while the movement of the tectonic plates towards each other is called convergent movement.
- 10- The divergent movement is caused by rising (upwards) convection currents, while the convergent movement is caused by descending (downward) convection currents.
- 11- African Great Rift Valley is the largest rift in the world, formed by the divergent movement of two continental plates.
- 12- Himalayan mountain ranges were formed from the convergence of two continental plates, while Andes mountain ranges were formed from the convergence of a continental plate with an oceanic plate.
- 13- The peaks of the Himalayan mountain range are higher than the peaks of the Andes mountain range.
- 14- Transform movements lead to the formation of long faults.

- 15- Scientists predict that the Mediterranean Sea will turn in the future into a mountainous continental region.
- 16- Strong earthquakes lead to the occurrence of tsunamis, which change the shape of coastlines.
- 17- Volcanoes lead to the formation of flat plains, while earthquakes lead to the emergence of islands and coasts.
- 18- It is assumed that the fall of meteorites was the cause of the extinction of the dinosaurs.
- 19- The DART system is an advanced radar system that protects Earth from the dangers of meteorites.
- 20- Among the mechanical weathering methods are the wind, difference in temperatures and running water.
- 21- Erosion is the process of transporting rock fragments resulting from weathering away from the areas where they were originally found.
- 22- Red iron oxide occurs naturally in the form of the hematite mineral.
- 23- The colour of quartz changes depending on the type of impurities present in it.
- 24- Minerals are classified according to their transparency into transparent, translucent and opaque minerals.
- 25- Quartz is a transparent mineral rich in silicates, while mica is a translucent mineral rich in silicates.
- 26- Among the methods of minerals formation are solidification of magma and crystallization of solutions from hydrothermal vents.
- 27- The minerals rich in magnesium and iron elements are olivine and pyroxene.
- 28- Hydrothermal vents are cracks on the ocean floor from which the ocean hot water rich in minerals rises as a result of tectonic plates movement.
- 29- Among the minerals formed by crystallization are apatite and calcite.
- 30- Soil is classified depending on the way it was formed into transported soil and sedentary soil.
- 31- The soil transported from one place to another by rivers is called transported river soil.

- 32- Nile Delta soil has formed from the transportation of rock fragments from the Ethiopian plateau to Egypt.
- 33- The soil that has formed and remained in the same location is known as sedentary soil.
- 34- Mariout soil and Oasis soil are residual sedentary soils in Egypt that both formed by the weathering and decomposition of sandy and limestone rocks.
- 35- Among the forms of renewable energy are solar energy, wind energy and hydroelectric energy.
- 36- The sustainability of non-renewable natural resources requires their preservation from depletion and finding new alternatives for them.

3) Write the scientific term:

- 1- A scientific hypothesis proposed that Earth was once a single massive continent.
(The continental drift hypothesis)
- 2- A single massive continent that Wegener assumed to be found 200 million years ago.
(Pangaea)
- 3- The plates that make up Earth's lithosphere.
(Tectonic plates)
- 4- The plates located beneath the oceans.
(Oceanic plates)
- 5- They are the areas where the plates diverge.
(Divergent boundaries)
- 6- The movement of tectonic plates sliding parallel to each other.
(Transform movement)
- 7- The advanced radar system that changes the orbit of meteorites.
(DART)
- 8- The process of breaking and fragmenting the rocks through mechanical or chemical methods.
(Weathering)
- 9- Shiny mineral that was used by the ancient Egyptians in the production of kohl.
(Galena)
- 10- The ability of a material to allow light to pass through it.
(Transparency)

- 11- The solution that can't accept more of the solute at the same temperature. (Saturated solution)
- 12- The formation of crystals from a supersaturated solution upon cooling. (Crystallization)
- 13- The surface layer of Earth's crust. (Soil)
- 14- The decomposed organic matter found in the soil. (Humus)
- 15- The resources that cannot be replenished once consumed. (Non-renewable resources)
- *****

4) What is meant by:

1- Asthenosphere.

- It is a layer of molten rocks (magma) found below the lithosphere.

2- Transform boundaries.

- They are the areas where the plates move parallel to each other..

3- Volcanoes.

- They are vents in Earth's crust that allow molten rock and trapped gases to escape to Earth's surface.

4- Meteorites.

- They are rock masses that penetrate Earth's atmosphere and fall to the ground.

5- Minerals.

- Naturally occurring solid inorganic substances that have a crystalline structure and a specific chemical composition.

6- Solution.

- It is a homogeneous mixture of a solvent and a solute.

7- The Soil.

- It is the surface layer of Earth's crust resulting from the fragmentation of rocks and the decomposition of organic matter, or both.

8- Residual sedentary soil.

- It is the soil that has formed as a result of the slow weathering of rocks in the same place.

5) Put (✓) or (x):

- 1- The scientist Wegener proposed the theory of tectonic plates. (x)
- 2- Earth's lithosphere is composed of several plates of different sizes and shapes. (✓)
- 3- The continental plates are composed of oceanic crust. (x)
- 4- The Red Sea may turn into an ocean in the future. (✓)
- 5- Divergent boundaries are the boundaries at which the tectonic plates converge. (x)
- 6- The Andes mountain range is higher than the Himalayas. (x)
- 7- When an oceanic plate diverges from a continental plate, the oceanic plate subducts beneath the continental plate. (x)
- 8- Tectonic earthquakes occur at the convergent, divergent and transform boundaries. (✓)
- 9- Earthquakes are similar in origin and intensity. (x)
- 10- The tsunamis often occur due to strong earthquakes. (✓)
- 11- Volcanoes form flat plains and plateaus. (✓)
- 12- The pattern of an earthquake differs from the pattern of a volcano. (x)
- 13- The geological processes lead to the formation of minerals. (✓)
- 14- The chemical weathering occurs when roots grow inside rock crevices. (x)
- 15- Minerals are made up of rocks. (x)
- 16- Minerals exist in the form of organic elements or compounds. (x)
- 17- Minerals can be distinguished based on their transparency and luster. (✓)
- 18- The presence of impurities in the mineral gives it multiple colours. (✓)
- 19- Opal is a mineraloid that has a defined crystalline structure. (x)
- 20- Quartz is an opaque mineral. (x)
- 21- Magma may be rich in silica, magnesium and iron. (✓)
- 22- Silica is the basic chemical substance that makes up the magma which forms mica. (✓)
- 23- Quartz is among the minerals with definite (fixed) colors. (x)
- 24- Mature soil contains water, air, clay, silt, gravel, sand and humus. (✓)

- 25- Most Egyptian soil is of the transported type. (✓)
- 26- River soil is one of the types of sedentary soil. (x)
- 27- Mariout soil and Oasis soil have the same origin. (✓)
- 28- Oasis soil has formed in a place far from where it has been broken. (x)
- 29- Non-renewable resources such as minerals and oil can be obtained from all Earth's spheres. (x)
- 30- Mining minerals is more preferred rather than recycling them. (x)
- *****

6) Correct the underlined words:

- 1- 135 million years ago, the continents of Asia and South America started to separate from each other. (Africa)
- 2- The tectonic plates move rapidly above the asthenosphere. (slowly)
- 3- The oceanic plates are composed of continental crust. (continental)
- 4- Convection currents occur beneath the tectonic plates in the outer core. (upper mantle)
- 5- There are four types of plate tectonic movement. (3)
- 6- Convection currents cause the divergent and transform movements of the tectonic plates. (convergent)
- 7- The formation of the Red Sea is due to the convergent movement of tectonic plates. (divergent)
- 8- The Mediterranean Sea contains an abundance of red algae. (Red)
- 9- The most common earthquakes are structural earthquakes. (tectonic)
- 10- Volcanoes cause landslides or landslips. (Earthquakes)
- 11- Volcanoes occur at the convergent and transform boundaries only. (divergent)
- 12- Earthquakes are natural phenomena that cause changes in the course of rivers. (Volcanoes)
- 13- Rock masses that penetrate the atmosphere and fall to Earth are called lava. (meteorites)
- 14- The DART radar system is designed to determine the orbits of meteorites. (change)

- 15- Table sugar is extracted from the mineral halite. (Table salt)
- 16- Sulphur mineral is red in colour. (yellow)
- 17- Quartz is a transparent metal that may occur in a pink form. (mineral)
- 18- Talc is a transparent mineral. (an opaque)
- 19- Magnesium-rich magma forms quartz when it solidifies. (Silica)
- 20- The temperature of the water near magma chamber can reach 1000°C. (400)
- 21- Hydrothermal vents are formed near the active earthquakes zones. (volcanic)
- 22- Solidification is the method of mineral formation from solutions in hydrothermal vents. (Crystallization)
- 23- Apatite is a mineral formed by magma solidification. (Quartz)
- 24- Crystals can be formed from the unsaturated solution of sodium acetate. (supersaturated)
- 25- Transported soil has the same chemical composition of the rocks above it. (Sedentary)
- 26- The type of Oasis soil is river-sedentary. (residual)
- 27- Industry is the extraction of natural resources from the Earth. (Mining)
- 28- Extracting minerals is the reuse of minerals instead of new mining. (Recycling)

7) Mention the difference between (compare):

- 1- Divergent movement and convergent movement in terms of definition.

Divergent movement	Convergent movement
The movement of tectonic plates away from each other due to the upwards convection current.	The movement of tectonic plates towards each other due to the downward convection current.

2- The Himalayan mountain range and the Andes mountain range in terms of (Way of formation – Elevation – Geographical extension).

P.O.C.	Himalayan	Andes
Formation	Convergence between two continental plates.	Convergence of an oceanic plate with a continental plate.
Elevation	Their peaks are higher.	Their peaks are lower.
Extension	Shorter.	Longer.

3- Earthquakes and Volcanoes in terms of (Definition – origin – Effect on Earth's surface – The resulting losses).

P.O.C.	Earthquakes	Volcanoes
Definition	They are rapid, successive natural tremors that occur in Earth's crust.	They are vents in Earth's crust that allows molten rock and trapped gases to escape to Earth's surface.
Origin	Divergent, convergent and transform movements of the tectonic plates.	Divergent and convergent movements of the tectonic plates.
Effect on Earth's surface	1- The emergence or submergence of some islands and coasts. 2- Landslides or landslips. 3- The formation of Earth cracks. 4- The tsunamis.	1- The formation of volcanic mountains. 2- Formation of flat plains and plateaus. 3- Disappearance of valleys and rivers. 4- Change in the rivers courses. 5- Formation of volcanic islands
The resulting losses	1- <u>Human casualties</u>: including deaths and injuries. 2- <u>Material losses</u>: in the form of destruction of facilities and infrastructure	1- <u>Human casualties</u>: due to inhalation of toxic gases and volcanic ash. 2- <u>Environmental losses</u>: such as covering of cities with volcanic ash, pollution of air and water and the formation of acid rains.

4- Unsaturated solution and supersaturated solution.

Unsaturated solution	Supersaturated solution
The solution that can accept more of the solute at the same temperature.	The solution that can accept more of the solute by raising temperature.

5- Calcite and pyroxene in terms of origin.

Calcite	Pyroxene
Formed by crystallization of solutions from hydrothermal vents.	Formed by solidification of magma rich in magnesium and iron.

6- The soil of the Nile Delta and the soil of Mariout.

Soil of the Nile Delta	Soil of Mariout
It is transported river soil.	It is residual sedentary soil.
Its chemical composition differs from the composition of the rock above it.	Its chemical composition similar to the composition of the rock above it.

8) Give an example for:

1- Material loss caused by earthquakes.

(destruction of facilities and infrastructure)

2- Environmental loss caused by volcanoes.

(Pollution of air and water and the formation of acid rains)

3- Massive crater in Egypt.

(Mount Kamel crater)

4- Massive crater in USA.

(Arizona crater)

5- Element mineral.

(Sulphur)

6- Compound mineral.

(Hematite, halite)

7- Shiny (luster) mineral.

(Galena)

8- Iron-rich mineral.

(Hematite)

9- Silica-rich mineral.

(Mica, Quartz)

10- Residual sedentary soil.

(Mariout soil, Oasis soil)

9) Give reason for:

- 1- Some rocks on the west coast of Africa and the east coast of South America contain similar remains of ancient organisms.
 - Because they both were a single large continent called Pangaea in ancient times.
- 2- Movement of tectonic plates.
 - Due to the movement of the convection currents in the upper mantle.
- 3- The divergence of tectonic plates from each other.
 - Due to the descending (downward) convection currents.
- 4- The convergence of the tectonic plates towards each other.
 - Due to the rising (upward) convection currents.
- 5- Subduction of oceanic plates beneath continental plates.
 - Because the density of oceanic plate is greater than that of the continental plate.
- 6- The formation of the Himalayan mountain range.
 - Due to convergence between two continental plates.
- 7- The formation of the African Great Rift Valley.
 - Due to divergence between two continental plates.
- 8- The Andes Mountains are longer than the Himalayas.
 - Because of their geographical extension.
- 9- The probability of the Red Sea turning into an ocean.
(The probability of the Mediterranean Sea transforming into a mountainous continental region.)
 - Due to the continuous movement of tectonic plates over time.
- 10- Formation of new volcanic island chains, such as the formation of the Japanese islands.
 - Due to the convergence between two oceanic plates.
- 11- Occurrence of the San Andreas Fault.
 - Due to the transform movement of tectonic plates.
- 12- The occurrence of tectonic earthquakes.
 - Due to the release of stored energy in the Earth's crust when the rocks break.

13- Tsunamis occur on coasts.

- Due to strong earthquakes.

14- The occurrence of volcanoes.

- Due to the divergent and convergent movement of tectonic plates.

15- The pattern of earthquakes is similar to the pattern of volcanoes.

- Because they don't occur randomly, but they are distributed in a clear pattern along the boundaries of tectonic plates.

16- Volcanoes change the features of the Earth's surface.

- Because they lead to changes of Earth's surface such as the formation of volcanic mountains, formation of flat plains and plateaus, disappearance of valleys and rivers, change in the rivers courses and formation of volcanic islands.

17- The extinction of dinosaurs in ancient times before the existence of human.

(Formation of the crater of Mount Kamel in the Western Desert.)

(Formation of Arizona crater in the United States.)

- Due to the fall of a massive meteorite.

18- The DART radar system protects Earth from dangers.

- Because it changes the orbits of meteorites so they can't reach Earth.

19- There are many forms of minerals.

- Due to the differences in chemical composition and physical properties of minerals.

20- Oil is not considered a mineral.

- Because the origin of oil is organic.

21- Plants play an effective role in the weathering of rocks.

- Because the growth of plant roots in rock cracks causes their mechanical weathering.

22- Erosion process is related to the weathering process.

- Because erosion is the process of transporting rock fragments resulting from weathering away from their original place.

23- Sulphur mineral can be distinguished from hematite mineral by its colour.

- Because sulphur mineral is yellow, while hematite is red.

24- Carbohydrates and table sugar (glucose) are not considered a mineral.

- Because they are organic substances, while minerals are inorganic substances.

25- Minerals differ from each other in terms of transparency.

- Because they differ in their ability to transmit light.

26- Opal is not classified as a mineral.

- Because it does not have a specific crystalline structure.

27- The use of some minerals by the ancient Egyptians.

- To make eye makeup (kohl) as they have luster.

28- Talc mineral is considered opaque mineral.

- Because light does not pass through them.

29- Mica is classified as a translucent (semi-transparent) mineral.

- Because light passes through them to a limited extent.

30- The diversity of minerals formed from the solidification of magma.

- Due to the differences in chemical composition of magma that form minerals, where magma may be rich in silica, magnesium and iron.

31- The properties of transported soil differ from Sedentary soil.

- Because they differ in the way of their formation that leads to difference in their chemical composition.

32- The chemical composition of Nile Delta soil (or transported soil) differs from the composition of the original rocks beneath it.

- Because it has been broken down in one place and then transported to another place.

33- Minerals and fossil fuels are considered non-renewable resources.

- Because they are natural resources that can be obtained from Earth's spheres, (excluding the biosphere), and cannot be replenished once consumed.

34- The increases in consumption of non-renewable resources.

- Due to industrial revolution, especially with the growth of the population and the advancement of industry.

10) What are the results of (What happens...)?

1- The movement of the convection currents in the upper mantle.

- Tectonic plates move in a slow and continuous movement, barely noticeable in relation to each other above the asthenosphere.

2- The movement of the tectonic plates.

- Changing the appearance of the Earth's surface.

3- The movement of upward convection currents.

- The divergent movement of tectonic plates.

4- The movement of downward convection currents.

- The convergent movement of tectonic plates.

5- The movement of the divergent plates.

(The divergence of two continental plates.)

- The formation of new continental crust (such as the Red Sea) or new oceanic crust (such as African Great Rift Valley).

6- The convergence of two continental plates.

- The formation of mountain ranges (such as the Himalayas).

7- The convergence of two oceanic plates.

- The formation of volcanic island chains (like the Japanese Islands).

8- The convergence of an oceanic plate with a continental plate.

- The oceanic plate subducts under the continental plate, forming mountain ranges (like the Andes Mountains).

9- Tectonic plates moving side by side in opposite directions.

- The transform movement of tectonic plates.

10- The transform movement of tectonic plates.

- Long faults are formed such as the San Andreas fault.

11- The release of the energy stored in rocks when they break.

- Occurrence of tectonic earthquakes.

12- Rocks are not being exposed to any type of weathering.

- Soil will not be formed.

13- The presence of impurities in quartz mineral.

- It gives it variant colours such as violet and pink.

14- The light falls on pure quartz mineral.

➤ Light passes through it.

15- Dripping a supersaturated solution of sodium acetate into the cold solid salt of the same compound.

➤ Crystallization process occurs in which the excess salt collects around the cold salt, forming a column of crystals.

16- Contact between hydrothermal vent solutions with oceans water.

➤ Minerals crystallize such as apatite and calcite.

17- Slow weathering of sandy and limestone rocks in the same place.

➤ The formation of residual sedentary soil such as Mariout soil and Oasis soil.

18- Increased human activities in the fields of mining and oil.

(The control of the non-renewable resources by the major mining companies in the developed countries through the agreements.)

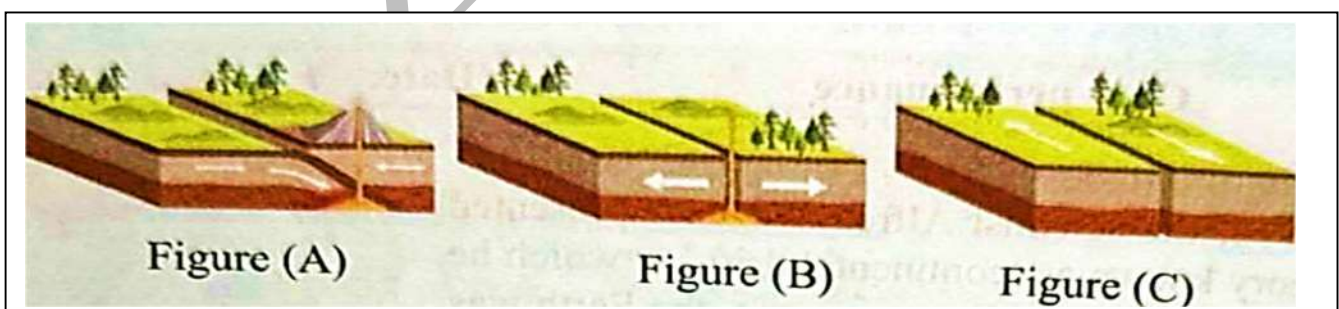
➤ The unfair distribution of non-renewable natural resources, that leads to their depletion.

19- Recycling minerals.

➤ Preserving them from depletion.

11) Study the following figures then answer:

1- The opposite figure shows the types of tectonic plates movements:

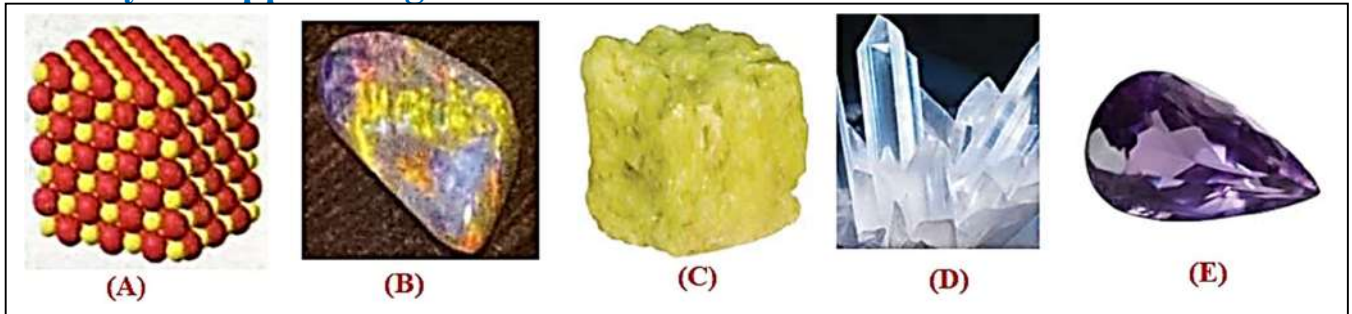


a) Figure (A) represents the convergent movement of tectonic plates that resulted in the formation of mountain ranges such as the Himalayan mountain in Asia.

b) Figure (B) represents the divergent movement of tectonic plates that caused by upward convection currents.

- c) Figure (C) represents the transform movement of tectonic plates in which the tectonic plates move parallel to each other.

2- Study the opposite figure then answer:



- a) The opposite figure shows different minerals, except figure (B) which is not considered a mineral but considered as a metalloid.
- b) Figure (C) represents element mineral, while figure (A) represents table salt crystal which is compound mineral known as hematite.
- c) What causes the colour of mineral (D) changes into (E).
- Presence of impurities.
- d) Minerals and oil are examples of non-renewable resources. Suggest some solutions to achieve their sustainability and reduce their depletion.
- Shifting to the use of renewable sources such as solar energy, wind energy and hydroelectric energy.
 - Recycling minerals instead of new mining.
 - Using technologies that consume less energy, such as electric cars and energy-efficient appliances.
 - Developing industrial alternatives to resources, such as rechargeable batteries.

حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

الترم الاول



Q1: Write down what the following sentences mean:

- 1- Everything that has mass and volume.
- 2- A state of matter that has a definite shape and fixed volume.
- 3- A state of matter that has the ability to spread and be compressed.
- 4- The state of matter that has a fixed volume and varies in shape with the container that contains it.
- 5- A theory that explains the behavior and properties of matter.
- 6- The movement of particles of matter in fluids is random in all directions.
- 7- A state of matter that occurs when gases are ionized into positively and negatively charged ions.
- 8- The change of matter from the solid state to the gaseous state directly
- 9- The change of matter from the gaseous state to the solid state directly
- 10- Coffee dissolves in water faster than regular coffee
- 11- A pot cooks food faster because it traps steam inside
- 12- The temperature at which matter changes from a solid to a liquid state.
- 13- The transformation of matter from a gaseous state to a liquid state by lowering the temperature.
- 14- The amount of heat required to raise the temperature of 1 kilogram of matter by 1 °C.
- 15- A system in which there is an exchange of matter and energy with the surrounding environment.
- 16- A system in which there is no exchange of matter and energy with the surrounding environment.
- 17- A system in which there is an exchange of energy without matter with the surrounding environment.
- 18- Sugars composed of 2 to 10 units of monosaccharaides.
- 19- Sugars composed of more than 10 units of monosaccharaides



- 20- A substance made of fat whose deposition inside arteries causes blockages and leads to heart diseases.
- 21- Proteins that can be used as catalysts.
- 22- Basic units that compose proteins.
- 23- A substance in which excess carbohydrates are stored.
- 24- A substance used to detect glucose sugar.
- 25- Vessels that allow nutrients to move from the leaves to the rest of the plant parts.
- 26- A type of pigment inside chloroplasts that gives plant leaves their green color.
- 27- The ground of the plastid (the matrix) contains the enzymes necessary for Photosynthesis.
- 28- A theory presented by the German scientist Wegener.
- 29- The Earth's crust, in addition to the solid part of the upper mantle.
- 30- The oceanic crust and the continental crust, which consist of solid plates of different shapes and sizes.
- 31- Plates composed of thin oceanic crust with high density and part of the upper mantle.
- 32- Plates composed of thick crust and part of the upper mantle.
- 33- A layer of molten rocks.
- 34- The regions where tectonic plates diverge.
- 35- The regions where tectonic plates move in a parallel manner
- 36- Rapid, successive, Natural tremors occurring in the Earth's crust.
- 37- An opening in the Earth's crust that allows molten rocks and trapped gases to escape to the Earth's surface.
- 38- Rock masses that penetrate the Earth's atmosphere.
- 39- An advanced radar system whose function is to change the orbit of Meteorites
- 40- A mineral from the transparent minerals.
- 41- A mineral from the semi-transparent minerals.
- 42- Natural inorganic solid substances with a crystalline structure and a definite chemical composition.



43- Soil formed as a result of the slow weathering of rocks in the same place.

Question 2: Give Reason for each of the following:

- 1- Solid matter has a fixed shape and a definite volume.
- 2- Gaseous matter has no fixed shape and no definite volume.
- 3- Liquid matter is flowable.
- 4- Gases are compressible.
- 5- Particles of matter spread faster in gases than in liquids.
- 6- Plasma is used in air conditioners.
- 7- It is difficult to break a piece of rock.
- 8- The possibility of dissolving a quantity of table salt in water.
- 9- Spreading of smoke produces from a candle wick in the air.
- 10- Feeling uncomfortable in hot, humid weather.
- 11- Wet clothes dry faster on sunny days than on humid days.
- 12- The pressure cooker saves fuel
- 13- The boiling point of water decreases with increasing altitude above sea
- 14- Clothes dry faster in summer than in winter
- 15- Wet clothes dry faster when exposed to air currents.
- 16- Copper and aluminum are thermally preferable materials for making heating utensils.
- 17- Mercury is used in the manufacture of thermometers.
- 18- Water makes up a large proportion of the human body.
- 19- Water is used to cool many systems.
- 20- When a zinc plate is placed in a beaker containing a blue copper sulphate solution, the blue color disappears.
- 21- A magnesium strip must be held with a tongs before lighting it with a flame.
- 22- There are cooling systems inside computers that use materials with good thermal conductivity, such as silver.
- 23- A heater is placed on the floor of a room.



- 24- The sun's heat reaches us by radiation.
- 25- The burning of wood is a chemical change, while the melting of ice is a physical change.
- 26- When burning a magnesium ribbon, it is a must to wear a protective mask.
- 27- Increasing temperature of a substance increases by decreasing its mass when it gains the same amount of thermal energy.
- 28- When heating two equal quantities of water and oil for the same period of time and from the same heat source, the increase in the oil's temperature is than that of water.
- 29- When a quantity of iron balls at 80°C is mixed with a quantity of water at 30°C , the temperature of the mixture at equilibrium is not 55°C .
- 30- Snakes are able to hunt their prey at night.
- 31- Cooking utensils are made of metal while their handles are made of wood or plastic.
- 32- Polystyrene boards are preferred for use between hollow bricks when constructing building walls.
- 33- An eagle soars at high altitudes without flapping its wings.
- 34- The sea breeze phenomenon occurs.
- 35- Heat transfers from the sun to the earth despite the great distance between them.
- 36- Heat transfers from a hot body to a cold body.
- 37- The refrigerator freezer is placed at the top of the refrigerator.
- 38- It is necessary to consume potatoes and rice in moderate quantities.
- 39- Carbohydrates play an important role in industry.
- 40- Sucrose is one of the limited sugars.
- 41- The color of Benedict's blue solution changes when added to different concentrations of glucose.
- 42- When iodine is added to potatoes, the iodine solution turns blue.
- 43- Biuret solution turns from blue to purple when added to egg whites.



- 44- There are multiple sources of proteins in food.
- 45- There are risks from the excessive use of nutritional supplements.
- 46- Proteins have great benefits in industries.
- 47- Flower petals are colorful.
- 48- Plant leaves appear green.
- 49- The importance of chlorophyll in photosynthesis process.
- 50- Volcanoes change the features of the Earth's surface.
- 51- Tsunamis occur on coasts.
- 52- Formation of new volcanic island chains, such as the formation of the Japanese islands.
- 53- Occurrence of the San Andreas Fault.
- 54- The multiplicity of tectonic plate movements.
- 55- The Andes Mountains are longer than the Himalayas.
- 56- Earthquakes and volcanoes cause major losses.
- 57- The extinction of dinosaurs in ancient times before the existence of humans.
- 58- The formation of minerals in nature.
- 59- Opal is not considered a mineral despite having luster and a definite chemical composition.
- 60- Minerals differ from each other in terms of transparency.
- 61- The increase in consumption of non-renewable resources.
- 62- The use of some minerals by the ancient Egyptians.
- 63- The diversity of minerals formed from the solidification of magma.
- 64- Transported soil differs in its chemical composition from the original rocks above which it lies.
- 65- Minerals and fossil fuels are considered non-renewable resources.

Question 3: Complete the following sentences with suitable words:



- 1- At normal atmospheric pressure, melting point of ice while boiling point of water
- 2- The... ..process is the reverse of.....process and freezing process is the reverse ofprocess.
- 3- As we go up, atmospheric pressure..... and boiling point of water... .. than 100°C .
- 4- change of matter is not accompanied by the formation of new substances, whereas change produces a new substance.
- 5- The greatest kinetic energy of matter particles is in the..... state and the least kinetic energy is in the..... state.
- 6- The substance changes from one state to another either by or
- 7- During and processes the temperature of the material remains constant.
- 8- The two factors that affect the melting and boiling points of a substance are..... and... ..
- 9-boils at a temperature of 100°C under normal atmospheric as atmospheric pressure increases, its boiling point becomes than 100°C , and its freezing point becomes..... than 0°C .
- 10- The..... system exchanges energy and matter with the surrounding medium
- 11- Thesystem does not exchange energy or matter with the surrounding medium.
- 12- The...system exchanges energy but not matter with the surrounding medium.
- 13- is the sum of the kinetic energy and potential energy of all particles of the system.
- 14- represents the degree of hotness or coldness of the system.
- 15- Substances can be classified according to their physical state to common states, that are solidand gases.



- 16- Fluids are substances that are in a..... or states
- 17- The matter is compressed in the..... state to reduce.....
- 18- The forces of attraction between particles of liquid matter are the interparticle distances are.....
- 19- There is a fourth state of matter known assuch as.....and.....
- 20- Plasma is used in air conditioners to purify air by..... pollutants and germs.
- 21-is a reverse process of deposition process.
- 22- The forces of attraction between particles of solid matter are.....and the interparticle distances are
- 23- Plasma is found in.....and.....
- 24- The states of matter vary depending on the..... between the particles.
- 25- The interparticle distances are as large as possible in the..... state due to..... between particles.
- 26- The interparticle distances are as small as possible in the case of..... state due to.....between the particles.
- 27- From the factors affecting melting and boiling points..... and...
- 28- The speed of drying clothes can be increased by..... or.....
- 29- A system is any part of the..... that is under study, where changes in..... and..... are observed.
- 30- Change in..... refers to transferring energy from or to the system.
- 31- Heat transfers in three different ways:,.....and
- 32- Energy transfers from a system with atemperature to a system with a temperature
- 33- The sun's heat reaches us by..... while a heater's heat reaches us by.....and
- 34- A.....camera can sense the.....radiation emitted by objects and convert it into color images.



- 35- Plants produce oxygen gas in the process of
- 36- Mitochondria perform..... process
- 37- The first stage of cellular respiration takes place in... ..
- 38- The second stage of cellular respiration takes place in
- 39- is used to detect the presence of carbon dioxide.

Question 4: Compare between: -

- 1- Evaporation and boiling in view of (Temperature - place of occurring - effect of pressure)
- 2- Evaporation and sublimation, mention example for each.
- 3- Open systems, closed systems, and isolated systems.
- 4- Thermally conductive materials and thermally insulating materials.
- 5- Physical change and chemical change.
- 6- Convection and Radiation.
- 7- Glycogen and protein.
- 8- The second stage of photosynthesis and cellular respiration.
- 9- The reactions of the first and second stages of cellular respiration.
- 10- The outer membrane and inner membrane of the mitochondria.
- 11- Transported soil and sedentary soil (in terms of formation method and chemical composition).
- 12- Catabolism and anabolism

Question5: What are the factors affecting each of the following.

- 1- the melting and boiling points?
- 2- the evaporation process
- 3- State of matter
- 4- Change in the temperature of objects
- 5- Speed of diffusion in liquids



Question6: Choose the correct answer: -

1. in which of the following processes the substance gains heat energy?
 - a) Freezing
 - b) Condensation
 - c) Sublimation
 - d) Deposition
2. When solid dry ice (CO_2) is heated, it turns directly into gas without passing through the liquid state. This process is called...
 - a) Evaporation
 - b) boiling
 - c) sublimation
 - d) melting
3. The internal energy of any system is
 - a) The potential energy of the particles only
 - b) The kinetic energy of the particles only
 - c) The sum of kinetic energy and potential energy of the particles
 - d) The emitted heat
4. When heating a substance, the kinetic energy of the particles.....
 - a) Decreases
 - b) Increases
 - c) Remains unchanged
 - d) Disappears
5. The change in temperature is calculated by
 - a) Electric potential
 - b) Distance meter
 - c) Thermometer
 - d) Barometer



6. A system that does not exchange matter or energy with surrounding medium is

- a) An open system
- b) A closed system
- c) An isolated system
- d) A thermal system

7. When the internal energy of a substance increases

- a) The temperature decreases
- b) The temperature remains the same
- c) The temperature increases
- d) The particles stop moving

Question7: Define each of the following:

- 1. Brownian motion.
- 2. Sublimation.
- 3. Plasma.
- 4. Particle theory of matter.
- 5. Closed system.
- 6. Temperature
- 7. Deposition
- 8. System
- 9. Isolated system
- 10. Open system
- 11. Internal Energy of the system
- 12. Temperature of the system
- 13. Specific Heat
- 14. Heat
- 15. Thermal equilibrium
- 16. Thermal conduction
- 17. Thermal conductivity
- 18. Thermally conductive materials
- 19. Thermally insulating Materials



20. Sea breeze
21. Chemical change.
22. Physical change.
23. Chemical equation
24. Balanced chemical equation
25. Catalysts
26. Law of Conservation of Mass
27. Subscripts
28. chemical reaction

Question 8: Multiple questions

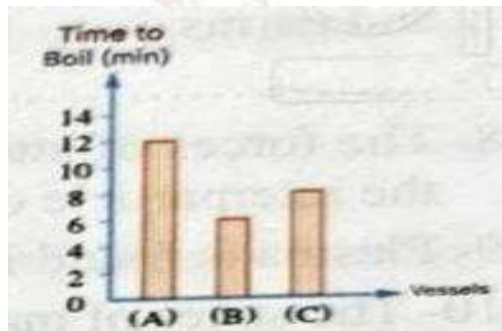
1. Does the relative stability of the river water temperature mean that it does not absorb thermal energy? Explain.
2. What is the difference between internal energy and temperature? according to the scientific terms?
3. Why is the average kinetic energy of hot water particles greater than that of cold water?
4. The following table shows a variety of places at different altitudes
Match each location with the appropriate boiling point of water for that location. What is your conclusion?

Boiling point of water	Altitude	Location
80.33°C ()	-427 m	1- Dead Sea
101.4°C ()	8848 m	2- Everest Summit
87.71°C ()	0 m	3- Sea level
69.94°C ()	3640 m	4- La Paz
100.1°C ()	5859 m	5- Kilimanjaro
99.96°C ()	14 m	6- London
100 °C ()	-28 m	7- Baku

5. The following graph shows the time it takes for three vessels containing different amounts of water to reach boiling point.
 - a) Which of these vessels contains the largest amount of water?



b) Identify the controlled variable and the independent variable in this experiment



6-What do you observe when...?

- a) Burning table sugar.
- b) Heating a mixture of caustic soda and oil with continuous stirring.
- c) Slices of apple or potato are left exposed to the open air.

7-How do you infer that a chemical reaction has occurred in the following experiments?

- a) Frying an egg.
- b) Igniting fireworks.
- c) Adding a piece of a magnesium strip to a test tube containing dilute hydrochloric acid

8- How does heat transfer in an electric oven? And why?

9-What are the factors that affect the temperature of a body (system)?

10-What are the steps of a chemical reaction?

11-What are the laboratory safety precautions when burning a magnesium ribbon?

12- Mention examples of some chemical reactions that occur in daily life.

13- Identify the function of the following parts:



a- Grana

b- Stroma

c- Double membrane

14- Use the following to write two equations, one expressing photosynthesis and the other expressing cellular respiration

$C_6H_{12}O_6$ - $6O_2$ - $6CO_2$ - $6H_2O$ - Light energy - ATP molecule energy

15- Mention one importance for each of the following:

a. Mitochondrial cristae.

b. The Krebs cycle.

c. Electron transport chain reactions.

d. Pyruvic acid in the Krebs cycle.

e. Metabolic analyzer.

16- What are the results of increased human activity in the fields of mining and oil?

17- What is meant by soil, and what does it consist of?

Question9: Write the balanced symbolic chemical equations that express the following reactions, with the physical state of the reactants and products:

1- Reaction of magnesium metal with dilute hydrochloric acid.

2- Combustion of ethane gas (C_2H_6) in an abundance of oxygen gas, with the

reaction condition.

3- Heating mercury (II) oxide powder strongly to form mercury and oxygen.



4- Reaction of magnesium with dilute sulfuric acid to form magnesium sulfate soluble in water and hydrogen gas.

5- Reaction of solid iodine with hydrogen gas to form hydrogen iodide gas.

6- Reaction of nitrogen gas with hydrogen gas to form ammonia gas.

Question10: Write the chemical formula for the following compounds:

1- Silver nitrate

2- Sodium chloride

3- Silver chloride

4- Sodium nitrate

5- Hydrochloric acid

6- Copper sulphate

7-Zinc sulphate

8- Magnesium oxide

9- Copper chloride

10- Sodium hydroxide

Question11: Correct the following statements:

1. Carbohydrates provide the body with twice the energy that fats do.

2. Glucose sugar is a monosaccharide.

3. Benedict's blue solution is used to detect fats.

4. Proteins accumulate in the blood as a result of a lack of insulin secretion.

5. Yogurt and eggs are sources of carbohydrates.



6. Sudan IV solution is used on the surfaces of mixtures that contain proteins.
7. Biuret solution changes color from blue to green when proteins are added.
- 8- The theory of plate tectonics was proposed by Alfred Wegener.
- 9-There are four types of plate tectonic movement.
- 10-Convergent movement results in the formation of faults.
- 11- Volcanoes cause landslides or landslips.
- 12-The most common earthquakes are structural earthquakes.
- 13- Olivine is one of the minerals formed from silica-rich magma.
- 14- Sulfur is the mineral that consists of table salt crystals.
- 15- Quartz is among the minerals with definite (fixed) colors.
- 16- Nile Delta soil in Egypt is Sedentary residual soil.
- 17- Hydrothermal vents are formed near earthquake zones.

Question 12: Correct the underlined statements:

- 1- Glucose is stored in plants in the form of protein
- 2- Vertical farming helps us solve the problem of flooding.
- 3- Photosynthesis takes place in the mitochondria found in the green parts of plants.
- 4-Light dependent reactions occur within the stroma found in green plastids.
- 5- The process of converting light energy into chemical energy within plants is known as combustion
- 6- When iodine solution is added to a green plant leaf containing starch, it turns red.



Q13: What happens when

- 1- Placing a plant with sodium carbonate under a glass bell jar in a dark place.
- 2- The reaction of pyruvic acid in the Krebs cycle.
- 3- The cristae of the mitochondria become flat.
- 4- The absence of oxygen in the two stages of cellular respiration.
- 5- Enzymes are removed from the mitochondrial matrix.



Question1: Write down what the following sentences mean:

- 1-Everything that has mass and volume. **Matter**
- 2- A state of matter that has a definite shape and fixed volume. **Solid state**
- 3- A state of matter that has the ability to spread and be compressed. **Gas state**
- 4- The state of matter that has a fixed volume and varies in shape with the container that contains it. **Liquid state**
- 5- A theory that explains the behavior and properties of matter. **The particle theory of matter**
- 6- The movement of particles of matter in fluids is random in all directions. **Brownian motion**
- 7- A state of matter that occurs when gases are ionized into positively and negatively charged ions. **Plasma state**
- 8- The change of matter from the solid state to the gaseous state directly **sublimation**
- 9- The change of matter from the gaseous state to the solid state directly **deposition**
- 10- Coffee dissolves in water faster than regular coffee **instant coffee**
- 11- A pot cooks food faster because it traps steam inside **pressure cooker**
- 12- The temperature at which matter changes from a solid to a liquid state. **Melting point**
- 13- The transformation of matter from a gaseous state to a liquid state by lowering the temperature. **Condensation**
- 14-The amount of heat required to raise the temperature of 1 kilogram of matter by 1 °C. **specific heat**



15-A system in which there is an exchange of matter and energy with the surrounding environment. **Open system**

16-A system in which there is no exchange of matter and energy with the surrounding environment. **Isolated system**

17-A system in which there is an exchange of energy without matter with the surrounding environment. **Closed system**

18. Sugars composed of 2 to 10 units of monosaccharaides. **Oligosaccharides**

19. Sugars composed of more than 10 units of monosaccharaides. **Polysaccharides**

20. A substance made of fat whose deposition inside arteries causes blockages and leads to heart diseases. **Cholesterol**

21. Proteins that can be used as catalysts. **Enzymes**

22. Basic units that compose proteins. **Amino acids**

23. A substance in which excess carbohydrates are stored. **Glycogen**

24. A substance used to detect glucose sugar. **Blue Benedict solution**

25- Vessels that allow nutrients to move from the leaves to the rest of the plant parts. **Phloem**

26- A type of pigment inside chloroplasts that gives plant leaves their green color. **Chlorophyll**

27- The ground of the plastid (the matrix) contains the enzymes necessary for

Photosynthesis. **Stroma**

28-A theory presented by the German scientist Wegener. **Continental drift**



29- The Earth's crust, in addition to the solid part of the upper mantle.

Lithosphere

30- The oceanic crust and the continental crust, which consist of solid plates of different shapes and sizes. **Tectonic plates**

31- Plates composed of thin oceanic crust with high density and part of the upper

mantle. **Oceanic plates**

32- Plates composed of thick crust and part of the upper mantle.

Continental plates

33- A layer of molten rocks. **Asthenosphere**

34. The regions where tectonic plates diverge. **Divergent boundaries**

35. The regions where tectonic plates move in a parallel manner.

Transform boundaries

36. Rapid, successive, Natural tremors occurring in the Earth's crust.

Earthquake

37-An opening in the Earth's crust that allows molten rocks and trapped gases to

escape to the Earth's surface. **Volcano**

38- Rock masses that penetrate the Earth's atmosphere. **Meteorites**

39- An advanced radar system whose function is to change the orbit of Meteorites **DART radar**

40- A mineral from the transparent minerals. **Pure quartz**

41 -A mineral from the semi-transparent minerals. **Mica**

42- Natural inorganic solid substances with a crystalline structure and a definite chemical composition. **Mineral**



43- Soil that formed as a result of the slow weathering of rocks in the same place.

Sedentary

Question2: Give scientific explanation for each of the following:

1- Solid matter has a fixed shape and a definite volume.

Because the forces of attraction between its particles are very strong and the distances between them are very small

2- Gaseous matter has no fixed shape and no definite volume.

Because the forces of attraction between its particles are very weak and the distances between them are very large

3- Liquid matter is flowable.

Because they have the ability to flow and take the shape of the container

4- Gases are compressible.

Because the interparticle spaces are very large

5- Particles of matter spread faster in gases than in liquids.

Because the interparticle spaces between particles of gases are very large

6- Plasma is used in air conditioners.

Charged particles of plasma breakdown harmful substances in air & kill bacteria, viruses

7- It is difficult to break a piece of rock.

Because the forces of attraction between rock particles are very strong and the distances between them are very small, so the particles tightly bound together

8- The possibility of dissolving a quantity of table salt in water.

Because the forces of attraction between water particles are relatively weak and the distances between them are relatively large, so these spaces are occupied by table salt particles



9- Spreading of smoke produces from a candle wick in the air.

Because the forces of attraction between air particles are very weak and the distances between them are very large, so the smoke particles spread through air

10-Feeling uncomfortable in hot, humid weather.

Because as the humidity increases the rate of evaporation decreases,
So sweat evaporation decreases and feel uncomfortable

11-Wet clothes dry faster on sunny days than on humid days.

Because on sunny days the rate of evaporation increases as the temperature increase while on humid days the rate of evaporation decreases

12- The pressure cooker saves fuel

Due to the increase of pressure inside it and raising the boiling point of water above 100°C this reduces the cooking time and save fuel

13- The boiling point of water decreases with increasing altitude above sea

As the altitude increase the atmospheric pressure decrease leading to lower boiling point

14- Clothes dry faster in summer than in winter

Because the rate of evaporation increases when the temperature rises

15- Wet clothes dry faster when exposed to air currents.

Because the rate of evaporation increases when the speed of air current increases

16- Copper and aluminum are thermally preferable materials for making heating utensils.

Because they have high thermal conductivity



17- Mercury is used in the manufacture of thermometers.

Because of its low specific heat so its temperature increases when it gains a small amount of heat

18- Water makes up a large proportion of the human body.

Because the specific heat of water is high, it contributes to the stability of body temperature

19- Water is used to cool many systems.

Due to its high specific heat, it absorbs large amount of thermal energy without significant increase in its temperature

20- When a zinc plate is placed in a beaker containing a blue copper sulphate solution, the blue color disappears.

The blue color of the copper sulfate solution disappears, forming a colorless zinc sulfate solution ZnSO_4 , and reddish brown copper is deposited on the zinc plate.

21- A magnesium strip must be held with a tongs before lighting it with a flame.

to avoid burns during heating.

22- There are cooling systems inside computers that use materials with good thermal conductivity, such as silver.

To get rid of the heat generated by internal components, which reduce their performance or cause damage.

23- A heater is placed on the floor of a room.

To ensure heat distribution throughout the room. as when the air around the space heater is heated, its density decreases and rise upward and the cold air replace the warm air



24-The sun's heat reaches us by radiation.

Because it travels through space without need of particles as electromagnetic waves

25-The burning of wood is a chemical change, while the melting of ice is a physical change.

Because the burning of wood results in new substances with different chemical properties from those of the original substances

While melting of ice is a change in the state and shape only without changing its chemical composition

26-When burning a magnesium ribbon, it is a must to wear a protective mask.

To avoid any burns or damage

27-Increasing temperature of a substance increases by decreasing its mass when it gains the same amount of thermal energy.

Because the thermal energy distributed over few number of particles

28-When heating two equal quantities of water and oil for the same period of time and from the same heat source, the increase in the oil's temperature is than that of water.

Because the specific heat of oil less than the specific heat of water

29- When a quantity of iron balls at 80°C is mixed with a quantity of water at 30°C , the temperature of the mixture at equilibrium is not 55°C .

Because they are different substances with different specific heat

30- Snakes are able to hunt their prey at night.

Because they sense the infrared rays from preys body due to sensory receptors at the front of their head



31-Cooking utensils are made of metal while their handles are made of wood or plastic.

Cooking utensils are made of metals because they are thermal conductors

their handles are made of plastic or wood because they are thermal insulators

32-Polystyrene boards are preferred for use between hollow bricks when constructing building walls.

Because polystyrene and air are thermal insulators which prevents rapid changes in temperature inside the buildings when the outside temperature changes, this reduces the cost of air conditioning

33- An eagle soars at high altitudes without flapping its wings.

The warm air near the Earth's surface has low density creating upward convection currents.

This upward force equals the force of gravity, allowing the eagle to remain floating in the air

34- The sea breeze phenomenon occurs.

Because the specific heat of land is less than that of water, so the air in contact with land becomes hotter, and rises upward and is replaced by cool air (breeze) from the sea direction.

35- Heat transfers from the sun to the earth despite the great distance between them.

Because the Sun's heat transfers to us by radiation without the need for material particles.

36- Heat transfers from a hot body to a cold body.

Due to the difference in temperature



37- The refrigerator freezer is placed at the top of the refrigerator.

To ensure distribution of heat throughout the refrigerators the colder air (higher density) sinks downward, and the warmer air (lower density) rises upward.

38- It is necessary to consume potatoes and rice in moderate quantities.

Because they contain large amount of carbohydrates

39- Carbohydrates play an important role in industry.

Because they are used to make paper, cosmetics and medicine capsules

40- Sucrose is one of the limited sugars.

Because it consists of two units of monosaccharaides

41- The color of Benedict's blue solution changes when added to different concentrations of glucose.

Because it turns red when sugar level is high, orange when sugar level is medium and green when it is low

42- When iodine is added to potatoes, the iodine solution turns blue.

Due to the presence of starch

43- Biuret solution turns from blue to purple when added to egg whites.

Due to the presence of proteins

44- There are multiple sources of proteins in food.

There are animal protein such as meat, egg and plant protein such as legumes and soybeans

45- There are risks from the excessive use of nutritional supplements.

Because they harm kidney and liver

46- Proteins have great benefits in industries.

Because they are used in the formation of insulin to treat diabetes by genetic engineering and enzymes used in laundry detergents

47- Flower petals are colorful.

Because it contains chromoplasts



48- Plant leaves appear green.

Because it contains chlorophyll that absorbs light spectrum but reflect green color

49- The importance of chlorophyll in photosynthesis process.

It absorbs the sunlight to make photosynthesis process

50- Volcanoes change the features of the Earth's surface.

Due to the formation of volcanic mountains, disappearance of valley and river and formation of volcanic islands

51- Tsunamis occur on coasts.

It is caused by earthquake

52- Formation of new volcanic island chains, such as the formation of the Japanese islands.

Due to the convergent movement of two oceanic plates

53- Occurrence of the San Andreas Fault.

Due to the transform movement of plates

54- The multiplicity of tectonic plate movements.

Due to the convection currents in the upper mantle

55- The Andes Mountains are longer than the Himalayas.

According to the geographical extension (length)

56- Earthquakes and volcanoes cause major losses.

Both cause human casualties (injuries, inhalation of toxic gases) and environmental losses (destruction of buildings , formation of acid rain)

57- The extinction of dinosaurs in ancient times before the existence of humans.

Because the falling of meteorites

58- The formation of minerals in nature.

Due to the solidification of magma and the crystallization of minerals from hot solutions (hydrothermal vents).

59- Opal is not considered a mineral despite having luster and a definite chemical composition.

Because it doesn't have a specific crystalline structure



- 60- Minerals differ from each other in terms of transparency.
Because they differ in their ability to allow light to pass through
- 61- The increase in consumption of non-renewable resources.
Due to population growth and industry development
- 62- The use of some minerals by the ancient Egyptians.
Because some minerals have a luster similar to that of metals such as galena
- 63- The diversity of minerals formed from the solidification of magma.
Because when silica rich magma solidifies, it forms minerals such as mica and quartz. If magma contains high amount of magnesium and iron, it solidifies to form minerals such as olivine and pyroxene
- 64- Transported soil differs in its chemical composition from the original rocks above which it lies.
Because it has been broken down in one place and transported to another place
- 65- Minerals and fossil fuels are considered non-renewable resources.
Because they can't be replenished once consumed

Question3: Complete the following sentences with suitable words:

- 1- At normal atmospheric pressure, melting point of ice**zero° C**
.....while boiling point of water **100° C**
- 2- The...**evaporation** ..process is the reverse of...**condensation**.....process
and freezing process is the reverse of ...**melting**process
- 3- As we go up, atmospheric pressure...**decreases**..... and boiling
point of water...**less**..... than 100° C.
- 4-...**physical**.....change of matter is not accompanied by the
formation of new substances, whereas**chemical** change
produces a new substance.



5- The greatest kinetic energy of matter particles is in the....**gas**..... state and the least kinetic energy is in the. **Solid**.... state

6- The substance changes from one state to another either by **.gaining** or**losing thermal energy**

7- During ...**melting**..... and ...**boiling**..... processes the temperature of the material remains constant.

8- The two factors that affect the melting and boiling points of a substance are...**purity of substance** and...**atmospheric pressure**.....

9- ..**water**.....boils at a temperature of 100°C under normal atmospheric as atmospheric pressure increases, its boiling point becomes ...**more**..... than 100 °C, and its freezing point becomes...**less**..... than 0°C.

10- The ..**open**..... system exchanges energy and matter with the surrounding medium

11- The ...**isolated**.....system does not exchange energy or matter with the surrounding medium

12-The...**closed**.....system exchanges energy but not matter with the surrounding medium

13-...**internal energy**..... is the sum of the kinetic energy and potential energy of all particles of the system

14-...**temperature**..... represents the degree of hotness or coldness of the system.

15- Substances can be classified according to their physical state to ..**three**..... common states, that are solid ,**liquid**.and gases.

16- Fluids are substances that are in I. **Liquid** or ..**gas** states



17-The matter is compressed in the...**gas**....state to reduce its**volume**

18- The forces of attraction between particles of liquid matter are ...**relatively weak** the interparticle distances are.....**medium** ...

19- There is a fourth state of matter known as **.plasma**.....such as.....**sun**.....and...**aurora**.....

20- Plasma is used in air conditioners to purify air by...**breakdown**pollutants and germs.

21- ...**sublimation**.....is a reverse process of deposition process.

22- The forces of attraction between particles of solid matter are...**very strong**.....and the interparticle distances are ...**very small** ..

23- Plasma is found in...**stars**.....and...**sun**.....

24- The states of matter vary depending on the...**attraction forces**..... between the particles.

25- The interparticle distances are as large as possible in the...**gas**....state

due to...**very weak attraction force**..... between particles.

26- The interparticle distances are as small as possible in the case of...**solid**.....state due to... **very strong attraction force**.....between the particles.

27-From the factors affecting melting and boiling points... **Atmospheric pressure** and.. **Degree of purity of matter**

28- The speed of drying clothes can be increased by.. **increase temperature**..... or..**speed of air current**....

29- A system is any part of the...**universe**..... that is under study, where changes in...**energy**..... and...**matter**.....are observed.



30- Change in...**temperature**..... refers to transfer energy from or to the system.

31- Heat transfers in three different ways: **Conduction, Convection** and **Radiation**.

32. Energy transfers from a system with a **high** temperature to a system with a **low** temperature.

33. The sun's heat reaches us by **radiation** while a heater's heat reaches us by **radiation** and **convection**

34. A **Thermographic** camera can sense the **infrared** radiation emitted by objects and convert it into color images.

35. Plants produce oxygen gas in the process of **photosynthesis**

36- Mitochondria perform.... **cellular respiration**...process

37.The first stage of cellular respiration takes place in...**cytoplasm**.....

38.The second stage of cellular respiration takes place in ...**mitochondria**.....

39.....**limewater**..... is used to detect the presence of carbon dioxide.

Question4: Compare between:-

1-Evaporation and boiling in view of (Temperature - place of occurring - effect of pressure)

Evaporation Process	Boiling Process
1. The process where a substance changes from the liquid state to the gaseous state at any temperature below its boiling point.	1. The process where a substance changes from the liquid state to the gaseous state at a specific temperature called the boiling point.
2. Occurs only at the surface of the liquid. Only surface molecules are involved.	2. Occurs throughout the entire volume of the liquid. All molecules are involved.
3. As the pressure decreases , the rate of evaporation increases	3. As the pressure decreases , the boiling point decreases

2-Evaporation and sublimation, mention example for each.

Process	Definition	Example	State change
Evaporation	Change of a liquid into gas from the surface only	Drying wet clothes	Liquid → Gas
Sublimation	Change of a solid directly into gas without passing through the liquid state	Iodine or dry ice	Solid → Gas

3- Open systems, closed systems, and isolated systems.

closed system

A system in which there is an exchange of energy without matter with the surrounding environment.

Such as thermometer

Isolated system

A system in which there is no exchange of matter and energy with the surrounding environment.

Such as thermos

Open system

A system in which there is an exchange of matter and energy with the surrounding environment.

Such as uncovered cup of tea



4- Thermally conductive materials and thermally insulating materials.

Thermally conductive materials

Materials that allow heat to flow through , have high thermal conductivity

Such as diamond , silver

Thermally insulating Materials

Materials that don't allow heat to flow through , have low thermal conductivity

Such as wood , plastic

5- Physical change and chemical change.

Chemical change.

is a change that results in new substances with different chemical properties from those of the original substances

such as burning of wood

Physical change.

is a change in the state or shape of a substance without changing its chemical composition such as melting of ice



6- Convection and Radiation.

Thermal convection	Thermal radiation
The transfer of thermal energy through fluids with the movement of their particles	The transfer of thermal energy from the surfaces of hot objects without the need for material particles
Heat transfers upwards (from the region of least density in the fluid to the region of greatest density)	Heat transfers in all directions
It occurs in liquid and gaseous matter (fluids)	It occurs in both vacuum (space) and gases
The space heater is placed on the floor of the room as the heat is transferred from the space heater to the air around it, causing the warm air to rise and the cold air to sink to replace the warm air and thus the heat is distributed throughout the room.	Thermography uses a camera to detect the thermal radiation emitted by objects and converts it into colored images. The colors depend on variations in the object's temperature. uses of Thermography :Imaging in darkness & Detecting the temperature of objects.

7-Glycogen and protein.

Glycogen is a polysaccharide formed from many glucose molecules, consists of C, H, O elements and stored in liver and muscles

Protein formed from many amino acids, consists of C, H, O, and N elements

8- The second stage of photosynthesis and cellular respiration.



The second stage of photosynthesis process It does not depend on the presence of light It occurs in the stroma of the chloroplasts It requires carbon dioxide and hydrogen molecules in the presence of enzymes and ATP energy molecules In this process, carbon, hydrogen and oxygen atoms are rearranged to form glucose molecules	The second stage of cellular respiration process It depends on the presence of atmospheric oxygen It occurs in the mitochondria It requires pyruvic acid and oxygen molecules in the presence of enzymes In this process, carbon, hydrogen and oxygen atoms are rearranged to form molecules of carbon dioxide and water, and a large amount of energy in form of ATP molecules
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9- The reactions of the first and second stages of cellular respiration.

3	The first stage of cellular respiration process	The second stage of cellular respiration process
Importance of the availability of oxygen	Occurs in the absence of oxygen	Occurs in the presence of oxygen
Amount of ATP molecules produced	Limited quantity	Large quantity

10- The outer membrane and inner membrane of the mitochondria.

1. **An outer membrane**, (flat) whose function is to protect the components of the mitochondrion and regulate the entry and exit of substances.
2. **An inner membrane** which forms folds called **cristae**, which increase the internal surface area of the mitochondrion where reactions occur, allowing more energy to be produced.



11-Transported soil and sedentary soil (in terms of formation method and chemical composition).

Transported soil has been broken down in one place and then transported to another place; its chemical composition differs from the composition of the rocks above it in its current location

Sedentary soil has formed and remained in the same location; it is similar to the original rocks above it in chemical composition

12-Catabolism and anabolism

6	Catabolic processes	Anabolic processes
Definition	They are processes in which the energy of ATP molecules is released by breaking down a large complex molecule that has been built before into simpler molecules	They are processes in which the energy of ATP molecules is consumed in building a large complex molecule from several simple molecules
Examples	• Breaking down of glucose molecules in cellular respiration process. • Breaking down of glycogen molecules in digestion process. • Breaking down of protein molecules in digestion process.	• Building glucose molecules in photosynthesis process. • Building glycogen molecules from glucose. • Building protein molecules from amino acids.

Question5: What are the factors affecting each of the following

1) the melting and boiling points?

- a) Atmospheric pressure
- b) Degree of purity of matter

2) the evaporation process

- a) Humidity
- b) Temperature
- c) Speed of air current
- d) Surface area



3) State of matter

a) Attraction force

b) Interparticle space

4) Change in the temperature of objects

a) Mass of substance

b) Type of substance

c) Its state

5) Speed of diffusion in liquids

a) Temperature

b) Viscosity

Question6: Choose the correct answer:-

1-In which of the following processes the substance gains heat energy?

a) Freezing

b) Condensation

c) Sublimation

d) Deposition

2- When solid dry ice (CO_2) is heated, it turns directly into gas without passing through the liquid state. This process is called...

a) Evaporation

b) boiling

c) sublimation

d) melting

3- The internal energy of any system is

a) The potential energy of the particles only

b) The kinetic energy of the particles only

c) The sum of kinetic energy and potential energy of the particles



d) The emitted heat

4- When heating a substance, the kinetic energy of the particles.....

a) Decreases

c) Increases

b) Remains unchanged

d) Disappears

5- The change in temperature is calculated by

a) Electric potential

c) Distance meter

b) Thermometer

d) Barometer

6- A system that does not exchange matter or energy with surrounding medium is

a) An open system

b) A closed system

c) An isolated system

d) A thermal system

7- When the internal energy of a substance increases

a) The temperature decreases

b) The temperature remains the same

c) The temperature increases

d) The particles stop moving



Question7: Define each of the following:

- 1- Brownian motion
The movement of particles of matter in fluids is random in all directions.
- 2- Sublimation.
The change of matter from the solid state to the gaseous state directly without passing through liquid
- 3- Plasma.
A state of matter that occurs when gases are ionized into positively and negatively charged ions.
- 4- Particle theory of matter.
A theory that explains the behavior and properties of matter.
- 5- Closed system.
A system in which there is an exchange of energy without matter with the surrounding environment
- 6- Temperature
a measure of the average kinetic energy of system particles
- 7- Deposition
The change of matter from the gaseous state to the solid state directly without passing through liquid
- 8- System
Any part of universe that is under study where change of matter and energy is observed
- 9- Isolated system
A system in which there is no exchange of matter and energy with the surrounding environment.
- 10- Open system
A system in which there is an exchange of matter and energy with the surrounding environment.
- 11- Internal Energy of the system
Sum of potential and kinetic energies of system particles



- 12- Temperature of the system
Measure the average kinetic energy of particles
- 13- Specific Heat
The amount of heat required to raise the temperature of 1 kilogram of matter by 1 °C.
- 14- Heat
The energy that is transferred from the system to another or to the surroundings due to the difference in their temperature
- 15- Thermal equilibrium
The state reached by two systems with different temperatures after they come into contact and their temperatures become equal.
- 16- Thermal conduction
The transfer of thermal energy through solid materials from one point to another without the movement of the particles from their positions.
- 17- Thermal conductivity
Measure the ability of substance to conduct heat
- 18- Thermally conductive materials
Materials that are good conductors of heat.
- 19- Thermally insulating Materials
Materials that are poor conductors of heat.
- 20- Sea breeze
Cool air blowing from sea to land during daytime
- 21- Chemical change.
is a change that results in new substances with different chemical properties from those of the original substances
- 22- Physical change.
is a change in the state or shape of a substance without changing its chemical composition
- 23- Chemical equation



Symbolic representation of the reactants and products using symbols and chemical formulas showing the simplest ratio between the number of atoms of elements or molecules entering and resulting from the reaction

24- Balanced chemical equation

A symbolic chemical equation in which the number of atom of each element of the reactants is equal to the number of atoms of the same element in products

25- Catalysts

A substance that increase the speed of chemical reaction without being changed

26- Law of Conservation of Mass

Total mass of substances involved in the chemical reaction equal to the total mass of products

27- Subscripts

Number below the symbols of elements represents number of atoms in a single molecule

28- chemical reaction

is the process of breaking the bonds between atoms of the reacting substances (reactants) and forming new bonds between atoms of the produced substances (products).

Question8: Multiple questions

1- Does the relative stability of the river water temperature mean that it does not absorb thermal energy? Explain.

No, it absorbs thermal energy

Water has high specific heat, so it can absorb large amount of heat without huge change in its temperature

2- What is the difference between internal energy and temperature? according to the scientific terms?

Internal energy: the summation of kinetic energy and potential energy of system



Temperature: the average kinetic energy of the particles

- 3- Why is the average kinetic energy of hot water particles greater than that of cold water?

Because heating water gives its particles more thermal energy so the particles move faster this means their kinetic energy increases

- 4- The following table shows a variety of places at different altitudes

Match each location with the appropriate boiling point of water for that location. What is your conclusion?

Conclusion: As altitude increases (pressure decreases), the boiling point decreases and vice versa

Boiling point of water	
80.33°C ()	5
101.4°C ()	1
87.71°C ()	4
69.94°C ()	2
100.1°C ()	7
99.96°C ()	6
100 °C ()	3

Altitude	Location
-427 m	1- Dead Sea
8848 m	2- Everest Summit
0 m	3- Sea level
3640 m	4- La Paz
5859 m	5- Kilimanjaro
14 m	6- London
-28 m	7- Baku



5- The following graph shows the time it takes for three vessels containing different amounts of water to reach boiling point.

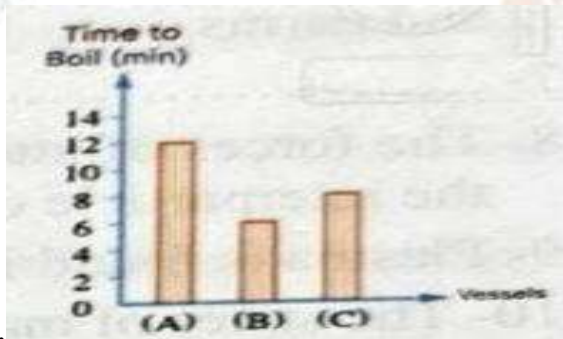
a) Which of these vessels contains the largest amount of water?

Vessel A

c) Identify the controlled variable and the independent variable in this experiment

Controlled variables: type of substance (water) and thermal energy source

Independent variables: mass of water



6-What do you observe when...?

a) Burning table sugar.

During the burning process:

- Sugar gradually turns into a brown molten liquid.
- strong odor appears (caramel smell)

After complete combustion:

- evolving of Smoke.
- The Color changes.
- a solid black substance (carbon) remains



b) Heating a mixture of caustic soda and oil with continuous stirring.

The texture changes over time, and the mixture transforms into a new solid Substance (soap)

c) Slices of apple or potato are left exposed to the open air.

A chemical reaction occurs with the atmospheric oxygen, causing the apple or the potato to turn brown

7- How do you infer that a chemical reaction has occurred in the following experiments?

a) Frying an egg.

change in the color and texture of both white and yellow parts.

b) Igniting fireworks.

a chemical reaction occurs, accompanied by the emission of light and heat.

c) Adding a piece of a magnesium strip to a test tube containing dilute hydrochloric acid

Bubbles of hydrogen gas are formed

8- How does heat transfer in an electric oven? And why?

By conduction: from hot metal of oven to the metallic utensils and food

By convection: by heating air inside the oven

By radiation: infrared radiation emitted from hot bodies

9- What are the factors that affect the temperature of a body (system)?

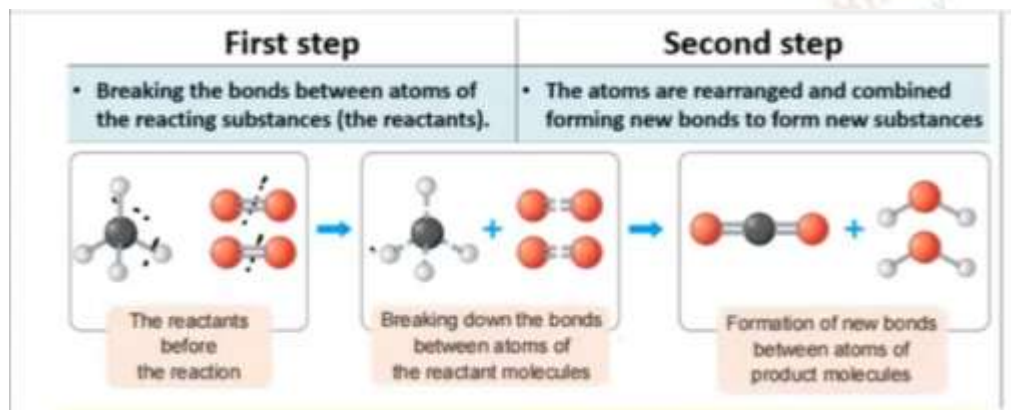
Mass of substance

Type of substance

State of substance



10- What are the steps of a chemical reaction?



11- What are the laboratory safety precautions when burning a magnesium ribbon?

Hold it with a tong

Wear a protective mask

Don't touch the powder immediately

12- Mention examples of some chemical reactions that occur in daily life.

Fireworks

Change apple slice into brown

Frying egg

13- Green plastids are made up of a group of components.

Identify the function of the following parts:

a- Grana **light dependent reactions occur in it**

b- Stroma **light independent reactions occur in it**

c- Double membrane **allow substances to move in and out chloroplast**



14. Use the following to write two equations, one expressing photosynthesis and the other expressing cellular respiration

$C_6H_{12}O_6$ - $6O_2$ - $6CO_2$ - $6H_2O$ - Light energy - ATP molecule energy



15. Mention one importance for each of the following:

a. Mitochondrial cristae.

Increase the surface area of inner membrane where the reactions occur to produce more energy

b. The Krebs cycle.

Produce limited amount of energy ATP, CO_2 and electrons

c. Electron transport chain reactions.

Produce large amount of energy ATP and water

d. Pyruvic acid in the Krebs cycle.

Broken down to Produce limited amount of energy ATP, CO_2 and electrons

e. Metabolic analyzer.

Helps in effective planning of diet, exercise for managing body weight

16. What are the results of increased human activity in the fields of mining and oil?

Causes depletion of non-renewable resources

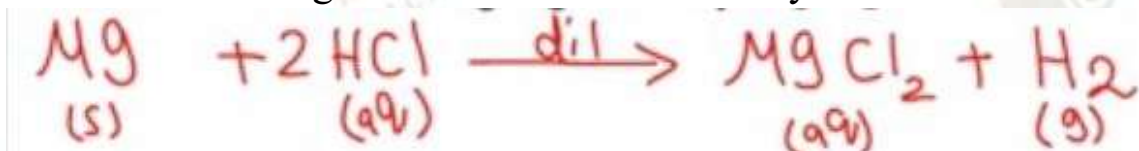
17. What is meant by soil, and what does it consist of?



It is the surface layer of earth crust resulting from the fragmentation of rocks and decomposition of organic matter
Mature soil contains water, air, humus , clay, silt, gravel and sand

Question9: Write the balanced symbolic chemical equations that express the following reactions, with the physical state of the reactants and products:

1- Reaction of magnesium metal with dilute hydrochloric acid.



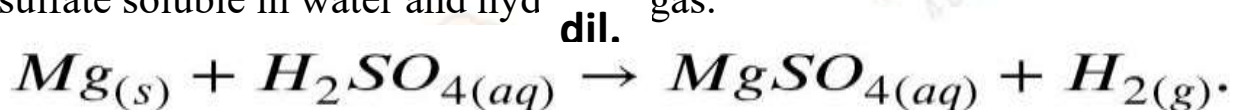
2- Combustion of ethane gas (C₂H₆) in an abundance of oxygen gas, with the reaction condition.



3- Heating mercury (II) oxide powder strongly to form mercury and oxygen.



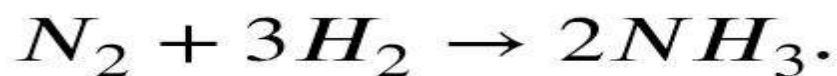
4- Reaction of magnesium with dilute sulfuric acid to form magnesium sulfate soluble in water and hydrogen gas.



5- Reaction of solid iodine with hydrogen gas to form hydrogen iodide gas.



6- Reaction of nitrogen gas with hydrogen gas to form ammonia gas.



Question10: Write the chemical formula for the following compounds:

- 1- Silver nitrate $AgNO_3$
- 2- Sodium chloride $NaCl$
- 3- Silver chloride $AgCl$
- 4- Sodium nitrate $NaNO_3$
- 5- Hydrochloric acid HCl
- 6- Copper sulphate $CuSO_4$
- 7- Zinc sulphate $ZnSO_4$
- 8- Magnesium oxide MgO
- 9- Copper chloride $CuCl_2$
- 10- Sodium hydroxide $NaOH$

Question 11: Correct the following statements:

1. Carbohydrates provide the body with twice the energy that fats do.

Fats provide the body with twice the energy that Carbohydrates do

2. Glucose sugar is a monosaccharide.

3. Benedict's blue solution is used to detect fats.

Benedict's blue solution is used to detect glucose sugar.

4. Proteins accumulate in the blood as a result of a lack of insulin secretion.

sugar accumulate in the blood as a result of a lack of insulin secretion.



5. Yogurt and eggs are sources of carbohydrates.

Yogurt and eggs are sources of protein

6. Sudan IV solution is used on the surfaces of mixtures that contain proteins.

Sudan IV solution is used on the surfaces of mixtures that contain fats

7. Biuret solution changes color from blue to green when proteins are added.

Biuret solution changes color from blue to violet when proteins are added

8- The theory of plate tectonics was proposed by Alfred Wegener.

The theory of **continental drift** was proposed by Alfred Wegener.

9-There are four types of plate tectonic movement.

There are 3 types of plate tectonic movement

10-Convergent movement results in the formation of faults.

Transform movement results in the formation of faults.

11- Volcanoes cause landslides or landslips.

Earthquake cause landslides or landslips.

12-The most common earthquakes are structural earthquakes.

The most common earthquakes are tectonic earthquakes.

13- Olivine is one of the minerals formed from silica-rich magma.

Mica is one of the minerals formed from silica-rich magma.

14- Sulfur is the mineral that consists of table salt crystals.

Halite is the mineral that consists of table salt crystals.

15- Quartz is among the minerals with definite (fixed) colors.



Sulphur is among the minerals with definite (fixed) colors

16- Nile Delta soil in Egypt is Sedentary residual soil.

Nile Delta soil in Egypt is transported soil.

17- Hydrothermal vents are formed near earthquake zones.

Hydrothermal vents are formed near active volcanic areas

Question 12: Correct the underlined statements:

1- Glucose is stored in plants in the form of protein. Starch

2- Vertical farming helps us solve the problem of flooding. Lack of arable land

3- Photosynthesis takes place in the mitochondria found in the green parts of plants. Chloroplast

4- Light dependent reactions occur within the stroma found in green plastids. Grana

5- The process of converting light energy into chemical energy within plants is known as combustion photosynthesis

6- When iodine solution is added to a green plant leaf containing starch, it turns red. Dark blue



Question 13: What happens

- 1- Placing a plant with sodium carbonate under a glass bell jar in a dark place.

The photosynthesis process stops while the respiration continue for a while then stops when all oxygen is consumed

- 2- The reaction of pyruvic acid in the Krebs cycle.

Produce CO₂, limited amount of ATP and electrons

- 3- The cristae of the mitochondria become flat.

Decrease in The rate of reactions inside mitochondria and the amount of produced energy

- 4- The absence of oxygen in the two stages of cellular respiration.

The first stage only will occur while the second stage won't occur

- 5- Enzymes are removed from the mitochondrial matrix.

Reactions inside it (Krebs cycle) won't happen and energy wouldn't be produced



كيفية طباعة صفحات معينة من ملف معين

مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

